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THE SECURITY OF ALASKA AND THE TUNDRA ARMY

Lieutenant Colonel Thomas O. Blakeney, *Armor*
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The views expressed in this article are the author's and are not necessarily those of the Department of the Army or the Command and General Staff College.—The Editor.

SOME 4 months before the Japanese attack on Pearl Harbor, General Simon Bolivar Buckner, the Army commander in Alaska, summed up the precarious military situation then by stating, "There exist alarming deficiencies in both Army and Navy facilities in Alaska. Each garrison is sufficient only to cope with minor raids or delay serious landing attempts for a short time. . . . Due to the utter lack of roads and railroads . . . the Army garrison cannot be regarded as anything but local defense forces. There exist no means now of determining when or where the enemy is coming and no way of stopping his approach if we know it."

No military man can intelligently argue the fact that it was necessary to employ the principle of economy of force in Alaska during World War II. If we cannot have adequate forces everywhere, then we must employ our mass where it will bring the greatest good and take a calculated risk elsewhere.

Today, the United States is again faced with uncertain world conditions. The sit-

uation is remarkably parallel to that existing just prior to Pearl Harbor, and, again, we find ourselves with something less than we would desire for adequate defense of the northern territories. The economy of force dictated by conditions in 1941 is as applicable today as it was then. The potential threat to Alaska—or to Canada and the United States through Alaska—is no less a threat today. It is obvious that the threat must be countered as it was in 1941, without seriously altering our military commitments elsewhere.

We can assume that all military means which can be spared have been allocated for the defense of this northern outpost. When all the military power that can be spared has been given, and this is still inadequate, then some other source of power must be tapped. Other nations have been faced with a similar problem for centuries. The English, defending their isle during the blitz, had to supplement their military forces with an effective home guard. Every able-bodied man in Switzerland is a trained soldier able to spring immediately to his country's defense.

The Problem Is Plural

The security of Alaska must include consideration of the terrain and climate (great distances and extremes of temperature), and the shortage of trained man-

Logistics and manpower are major issues in the security of Alaska. By training the native Alaskan to defend his homeland, we can alleviate our manpower shortage and reduce our logistical requirements there

power. All of these affect tactics, logistics, transportation, communications, and the availability of defensive forces.

There is a remarkable resemblance between the interior of Alaska and our western states just after the Civil War. The few existing railroads are similar to those operating during the "gay nineties" era—day coaches replete with pot-bellied stoves, overnight stops at Harvey Houses for meals and sleeping accommodations. Village streets resemble western movie sets, and winter travel off the few graveled roads is by skis, snowshoes, dog team, or air. It is not unusual for a bush pilot to fly a trapper or miner with dog team and supplies to some remote spot and then rendezvous with him after the ice melts in the summer.

Geographically, Alaska is a peninsula. Logistically, it is an island. The local people speak of "going outside" when they leave Alaska to travel to the United States. This phrase is more than a colloquialism, it is extremely descriptive of actual conditions. Communications between Alaska and the United States are limited to air and water, with only a small amount of traffic over the Alaska Highway. However, traffic by air and the Alaska Highway is small compared with the water traffic required to fill Alaska's needs. Even if the Alaska Highway could deliver the total requirements of the Territory to the Fairbanks terminal, transshipment to final destinations would require water, rail, or air travel.

Water Transport

Water transportation remains the vital link in the Alaskan logistical picture, yet it has serious limitations imposed by the rugged weather and terrain. The Alaskan coast line is more than 26,000 miles long. Many ports are icebound from September to May, and ships can get into Point Barrow only about 3 weeks of the year. As a consequence, only the summer months

can be used to transport sufficient supplies, by water, to last through the winter. Critical items, however, can be flown in as needed. The military logistician is faced with the problem of long-range planning to anticipate needs far in advance, and he must utilize the summer months for most of his shipping.

The Territory presently has very few good roads and this is a fact that the military planner must consider. Ten years ago, the only road of any significant length was the 370-mile Richardson Highway; a gravel road connecting Valdez with Fairbanks. In 1940, Alaska had a road network of 10,171 miles. Of this, only 2,212 miles were suitable for automobile and truck traffic. Trails and winter sled roads were the only other overland routes. This limited road net served an area of more than 600,000 square miles. Although the condition and amount of usable roads increased during the last war, the Territory is still critically short of good roads. This is an important factor in view of the United States Army's dependence on motor transport.

River Transport

For many years, the river systems offered the simplest and least expensive mode of transportation into the interior, with feeder sled roads and trails radiating from the rivers. River transport was not entirely satisfactory for civilian traffic and it was completely inadequate from a military standpoint. The rivers are free of ice for approximately 105 days out of the year, and even then they are treacherous because of the constantly shifting sand bars and channels.

Tractor-Train Transport

To supplement the river traffic, tractor-train freighting became an important adjunct to movement of civilian and military supplies. This type of freighting originated in the early 1930s to haul heavy



Water transportation remains the most important link in the Alaskan logistical picture in spite of the fact that shipping is limited to the few available ports and to a short summer season. Above, a typical stretch of rugged Alaskan coast line. Below, a Navy ice-breaker and transports in a northern resupply operation.—Department of Defense photos.



machinery to isolated mines. Improvements in tractor design led to widespread adoption of this means of transport, with the D7 and D8 caterpillar tractors supplying the motive power. During World War II, the Army had to resort to tractor-train freighting over sled roads and frozen rivers in the winter months in order to supply bases in the north. The trains were composed of tractor, cargo sleds, and a wannigan (a skid mounted shelter used by the crew for eating and sleeping). This type of freighting experienced considerable success and should be seriously considered for the supply of future operations in the Arctic. For example, a 350-mile trip was made by Morrison and Knudsen in 16 days which brought vital construction material to McGrath for Civil Aeronautics Authority projects. The Army later made a 200-mile trip from Nome to Teller bringing in 34 tons of frozen reindeer meat which prevented a 6-month meat shortage. A total of 436 tons of steel landing mats were transported from Fairbanks to Galena, a distance of about 250 miles, in a period of about 80 days. All of these moves were accomplished by tractor-train.

The tactical value of tractor-train freighting is important since it not only bridges the frozen period of the year, but also permits travel over land independent of roads. Estimates indicate that 200,000 tons can be hauled 700 miles (140,000,000 ton/miles) within a 4-month period by 500 tractors, 2,500 sleds, 500 wannigans, and a total of 2,400 crewmen. Based on the estimated requirements of 1.22 tons of supplies per man per month for arctic operations, simple arithmetic indicates that the personnel and equipment previously stated could maintain a reinforced regimental combat team with all classes of supplies while operating 700 miles from its base; a train of this size also could support an infantry division operating some 200 miles from its base. As the

supporting distance decreases, the size of the support force increases. Granted that air supply is faster and more flexible, it is doubtful that it can match the tractor-train in dollar cost per ton-mile, and poor flying conditions do not prevent tractor-train travel.

The Bush Pilot

Man's ingenuity has done much to overcome the difficulties imposed by weather and terrain. An important contribution to the opening of the northland was made by a hardy group of men known as bush pilots. These men, flying various types of aircraft under nearly all weather conditions, pioneered the extensive airway systems that serve Alaska today. The bush lines have gained a wealth of experience and knowledge over the years which can assist in the defense of the Territory. Bush pilots could be used as air scouts and information-gathering agents in their daily flights to remote parts of the Territory. If told what to look for and to whom to make reports, the bush pilots could contribute valuable information to the intelligence concerning Alaska.

The Dog Team

The military use of dog teams in Alaska is questionable. Prior to the development of the bush lines and tractor-trains, dog sleds were the only means of transporting heavy cargo over the snow-covered interiors. The average dog team can haul 6 tons of cargo approximately 20 miles a day. This distance is increased daily as the load is lightened as the food is consumed by the driver and his team. The Army first used dog teams in 1941, but experienced little return for the effort involved. The Air Force, however, was successful using dog teams for rescue work. Other means of transportation have pushed the use of dogs more and more into the background, and in the future they will probably be used only for rescue work. Certainly their use in a tactical

role is doubtful. The helicopter, however, may replace the dog team in rescue work.

Signal Communications

Any discussion of the defense of Alaska must consider the existing signal communications. Compared with the United States, the means of passing information is very meager. Army and Air Force communications are dependent on radio, which has inherent vulnerability to enemy jamming and interception. Communications are further hampered by the radio interference caused by the northern lights. Adequate and early warning of enemy action may depend upon the organization and utilization of the many "ham" radio stations that exist within the Territory. It is important, however, for the military man to know that this effective communications system does exist in even the most isolated communities and villages of Alaska. The Bureau of Indian Affairs monitors the network which consists of many amateur stations operated by school teachers, missionaries, and traders scattered throughout the most isolated areas of the Territory. These low-powered transmitters were of great value in the past, and have been used by many agencies and individuals having messages to send, including the Federal Bureau of Investigation. Their use as information passing agencies in event of hostile acts is extremely important. In addition to the "ham" stations, the radios of bush pilots and private airlines serve isolated communities. The Bureau of Fisheries, the Alaskan Railroad, and the Lighthouse Service operate other radio nets that can be integrated into a warning system and assist in the passing of information. By the end of 1943, some 575 radio stations of all types were operating in Alaska. All of these could contribute to the rapid flow of information.

The "ham" stations report an amazing amount of accurate news, which varies

from a statement that John Huttula is returning to the Territory from a visit "outside" to a warning that a blizzard is coming. The value of these stations and the people that run them should not be minimized by the military planner. Since telephones and telegraphs are scarce in Alaska and generally parallel the rail and highway routes, the radio "hams" contribute greatly to the flow of information.

Manpower Problem Solved

Another aspect of the security problem is the existing lack of manpower, and here we find a situation which can be improved. By examining what was done in the past, and profiting by past experiences, we can better determine how the job of security can be accomplished more effectively. The utilization of all available manpower must include consideration of the native Eskimos, Indians, and Aleuts.

Alaska has a small National Guard. Its growth and development has been a continual struggle to overcome great distances and limited facilities, funds, and manpower. The National Guard was started in 1940 and was called into Federal service in September 1941. It was rather insignificant in strength consisting of only the 1st Battalion of the 298th Infantry. Although the small Guard supplemented the regular defense forces, the fall of 1941 found Alaska with inadequate forces. There still was no way of determining if the enemy were coming and no way of stopping his advance if it were known. Alaska had no organized means for defense.

Potential Military Material

The native Alaskan does not resemble other Americans; his dress and speech are different, yet his ancestors are credited with being the first Americans. The fact that these natives have lived and flourished in a harsh land where few other peoples could endure, that they have depended

for their very existence upon their ability to withstand hardship and upon their accuracy with weapons, certainly indicates that they are potential military material. Add to these qualities the fact that they are American citizens who love their homeland and you have the important prerequisites of first-rate fighting men, the source of manpower which was tapped in 1942 to protect Alaska.

The Tundra Army

Historical records do not clearly indicate to whom the credit should go for organizing and arming the Eskimos. Regardless of whether it was conceived by the Governor's staff, the Army, or any one individual, the fact remains that the basic idea was sound. The degree to which the application of the idea was successful cannot be determined accurately for the Japanese attack which was expected was never made. Nevertheless, the arming of these people paid intrinsic dividends in basic Americanism. The United States Army gained experience with this new type of manpower which may aid in the future organization of similar types of units.

Origin

One report suggests that the original idea for a tundra army came from an American major. While visiting St. Lawrence Island in 1941, he found some 500 Eskimos greatly concerned about their homes and lives, and while they did not understand just what it was they feared, many actions indicated that something unusual was happening to their world that might seriously affect their very existence. All of the missionaries and teachers except one had left the island and the one who had remained was threatening to leave. The natives reported that a Japanese surveying party had visited the island only the year before.

The American officer told the natives to remain on their island and that he would return to the mainland and bring

them guns and equipment with which to defend their homes.

Several months passed before the major returned; months filled with political and military negotiations and plans. After the idea was sold, it had to be formalized by congressional authority. Plans were finally culminated when authority was granted for the organization of the native people into an Alaskan Territorial Guard (ATG) informally known as the Tundra Army. The final selling point for an ATG had been the need of the Governor of Alaska for a force prepared for the local defense of the outlying areas. The original Alaskan National Guard was, by that time, in Federal service, which left the Territory in the protection of local police and civil authorities. The 77th Congress authorized the formation of the Alaskan Territorial Guard on much the same basis as the state guards in the United States. Congress stipulated that during the time that the Alaska National Guard or any part of it was in Federal service, the Governor of Alaska could organize, through voluntary enlistments, a territorial guard under the regulations prescribed by the Secretary of War. Such arms and equipment as could be spared by the War Department were to be made available for their use.

The Tundra Army was conceived on St. Lawrence Island, and there it had its birth. The American major was able to keep his earlier promise by returning to the St. Lawrence Island with guns and ammunition drawn from Army surplus. Rifles were of World War I vintage: *Enfields* and *Springfields*. Some 150 Eskimos were given the oath as charter members of the Alaskan Territorial Guard—approximately 100 at Gambell and 50 at Savoonga. This was the beginning of the organization of several thousand native people into the ATG.

Composition

The Tundra Army was organized in an

area populated by some 20,000 Eskimos, Aleuts, and Indians. This figure includes the men, women, and children, so the number of able-bodied men available for the task was considerably less than the total 20,000. The total number actually involved as active members was about 2,700—a lack of accurate records prevents a thorough tabulation. Nearly every mature native man from Egegik to Point Barrow joined the ATG.

The Eskimos outnumber the Aleuts and Indians about 3 to 1 on population basis. The Eskimos live along the shores of the Bering Sea and the Arctic Ocean, on the islands of these seas, and along the rivers that drain into the sea from about 300 miles inland. From this point inland, the Indian predominates while the Aleuts live along the Alaskan peninsula and on the islands that bear their name. Thus, the Tundra Army was comprised of people living along the fan-like periphery of the northern Territory; an ideal location for a screening force with the mission of giving early warning of hostile attack.

A Beginning

Two Army officers were detailed as instructors for the ATG, but only one was really active and several enlisted instructors were later detailed to assist in training. The instructors traveled from village to village, from island to island, by any and all means of transportation available. Much of the travel was by air, but some was by dog team. Hardships which are inevitable during a northern winter were encountered by instructors. One instructor staggered into a village just ahead of a blizzard which froze three of his dogs, and on another trip he ran so short of food that he had to share the frozen fish usually fed to his dogs. The arrival of an instructor was the social event of the village. This arrival called for a feast and a formal drill period to show the new accomplishments of the unit.

Discipline and morale were not a problem with the Eskimo, nor was there ever a question of his basic loyalty to the United States. When the natives were first contacted they were frightened, afraid that the Japanese would come. After they were armed and organized, they hoped that the Japanese would come. One instructor warned: "If Jap come, he steal wife, steal igloo, steal furs, steal kayak, steal walrus." "We shoot Jap right in middle of forehead," was the reply of Chief John Alona at King Island and his attitude was typical. The natives were inspired and charged with the responsibility of serving their country and making a record for themselves. "From Bristol Bay to Point Barrow," they were told, "all are united in carving out for all Americans a great destiny for freedom."

The organization of the ATG was hampered by a lack of instructors, by the infrequency of their visits, by the great distances to be covered, and by the elements. However, their organization into some semblance of a military force had a profound effect on them. They had great pride in their unit, their shoulder patches, guns, helmets, and the parkas which were issued to them. It is amazing how much morale was built around the wearing of a simple shoulder patch. They were childishly happy with the shoulder patch of blue with its gold northern stars. This became their symbol of the force-in-being—it was their "uniform" and was worn on their parkas. When a boy reached the age of 16, he joined the ATG and thus became a man.

The Mission

The Alaskan Territorial Guard was organized as a home defense unit. No unit of the ATG was to be used except for the local defense of the community from which it was organized. As a home guard, it was not subject to call into Federal service. However, individual mem-

bers were not exempted by their membership from induction into any of the regular armed services of the United States. On the contrary, many Guardsmen were called and served with honor. Assuming that most of these veterans are still alive and still live in the far north, their use in training today or as a part of a new native security force would be valuable. Although membership in the ATG was voluntary, their period of service was for the duration of the emergency. The ranks were open to any male citizen over 16 years of age, with the usual stipulation that he must be capable of bearing arms, of temperate habits, and that he have no incapacitating physical or mental traits. Commissions, warrants, and promotions to noncommissioned ranks were to be made by the Governor. *All ranks served without pay.*

The ATG was given the general mission of co-operating with the regular armed services to assist in repelling attacks on the territory. In addition, the ATG was to resist actively raids on the local community, and thus provide a means of security for the isolated villages. Actually, the organization provided the Governor with a force that could have been used in many ways; to control domestic disturbances, to aid in disasters, and to guard vital areas where local police were not available. One very valuable use of the ATG was not listed in its mission. It seems obvious that the most important use of these people was the one job their daily activities placed them in the best possible position to perform. Their very existence is based on their ability as hunters and fishermen. Daily, they employ stealth, natural camouflage, and the ability to move quickly and shoot accurately to secure food. This is learned and applied from early childhood. This skill naturally falls into the requirements for scouting and patrolling. With training in military observation and reporting, the

Eskimo, Indian, and Aleut could provide intelligence coverage over a vast area. They could provide excellent scouting service while on hunting and fishing expeditions that comprise their daily lives. Rapid reporting and transmission of the information they gather was a difficulty that could have been overcome. "Ham" stations are located in the isolated communities from which the natives hunt and fish. The operators could be relied upon to pass information rapidly and accurately, especially when such information affected the security of their community. The screening and evaluation of the information would be left to military commanders.

The units of the Alaskan Territorial Guard were so widely separated as to preclude mutual support. Therefore, the idea of having these people actually fight other than as guerrillas is considered impractical. A company of from 20 to 60 Eskimos could not fight an effective defensive action against even a small organized invading force with its supporting weapons and to attempt such an action would be suicide. However, their ability to harass and kill under the hit-and-run tactics of guerrilla warfare could be of military value. Since the rifle is the Eskimo's most important means of obtaining his livelihood, he is, of necessity, an expert shot.

The Native Potential

We must revise our accepted techniques of basic training before they can be applied to the native Alaskan. Otherwise, we cannot realize the maximum from the native potential. It seems that the earlier training of the ATG was amazingly inflexible. Attempts to apply Army regulations and stylized training methods paid a small return for the effort expended. In the first place, most of our basic field manuals are not suited to the needs of the native nor to the job he is best fitted to perform.

It is difficult to understand why so much of the limited training time was spent on

close order drill and the manual of arms, and still more difficult to imagine an Eskimo unit marching in cadence over the snow. However, there is nothing ridiculous about a group of Eskimos engaged in realistic scouting and guerrilla exercises.

The natural, inherent qualities of the Eskimo should have served as a foundation for further training in patrolling and on the tactics of guerrilla fighting. This was a mistake and one which should not be repeated.

The Eskimo should become an important part of a military ground reconnaissance screen to our north and west. His nomadic travels cover an area far beyond his own village. During his normal rounds, he travels as much as 100 miles between his village and hunting or fishing sites. Since these people are practically the only inhabitants along the 5,000-mile frontier that faces the Soviet Union, they must compose the major portion of our local screening force. The only other alternative is the employment of American soldiers for this job.

It is militarily unsound to be on short intelligence concerning a possible enemy. The northern part of Alaska undoubtedly has few secrets from the Soviets. During World War II, they flew thousands of lend-lease airplanes from Fairbanks, Galena, and Nome into Siberia.

The first instructor assigned to the Alaskan Territorial Guard stated in his report that migrations between Siberia and Alaska were going on as late as 1944. He reported that he had seen parties of as many as 40 arrive from Siberia on hunting, fishing, or trading trips. He further stated that American Eskimos visit Siberia on similar missions. The accuracy of his observations cannot be determined, but such travels were and are possible. The military man should consider how these trips can be used either to assist

or retard our progress in Alaska. The security of Alaska demands an effective reconnaissance screen. The Eskimos are on the ground willing and capable of performing this mission.

Organization and Training

Let us consider some of the problems of organizing the native Alaskans. We want to obtain the maximum benefit from their services without interfering, unduly, with their normal way of life. The maximum benefit which we can obtain involves their employment as an outpost or reconnaissance force which projects our present frontier thousands of miles in the direction of a possible enemy. A force which would not only warn us of an invasion, but one which could give a good account of itself as guerrillas by harassing the enemy in the event of an actual invasion. These men can be counted upon to protect their homeland.

This does not call for a formal territorial guard organization; that would defeat our purpose and would not take advantage of the most valuable assets these men offer. They should be organized in such a way as to utilize the normal daily routine which they perform in pursuit of their livelihood: their periodic hunting, fishing, and trapping trips. This mobile screen would preclude hostile forces being landed which might otherwise go undiscovered for many months.

Their training should stress the type of information we desire and the method in which that information can best be reported promptly. Every attempt should be made to utilize "ham" radio stations in reporting information, at least until more efficient and secure military channels have been established. Obsolete military equipment would be a valuable contribution to their way of life and would assist them in extending and complementing existing communication systems.

Difficulties in training and equipping the

natives for the task of guerrillas and scouts are not insurmountable. It can be done with reasonable expense and effort. The native people have already proved themselves to be both enthusiastic and capable. They have first-hand knowledge of the terrain and elements. They can shoot or move with astonishing speed in summer and winter. They are courageous, inherently disciplined, and loyal. If we train and equip them in military observing, reporting, and guerrilla tactics; if we establish channels for passing information; if we tell the Eskimos what to look for, to whom to report, and what we want them to do under certain circumstances; then their contribution will be great. We

can greatly add to the protection of our country without seriously depleting our military commitments elsewhere.

Summary

The problems of logistics, transportation, communication, and security imposed by rugged terrain, great distance, and temperature extremes are not insurmountable either. Much has been accomplished in this respect during the past year and the future is even brighter. The frozen and forbidden northland is no longer a frightening military problem. As we gain knowledge and experience, the problems appear less difficult. Given time we can beat these problems.

NEXT MONTH

Main Articles

Who Dictates Destruction? by Lieutenant Colonel Harold J. St. Clair; and *Artillery—Arbiter of the Battlefield* by Lieutenant Colonel Leonard G. Robinson, Jr., are included among the main articles.

Foreign Military Digests

The foreign digests include "Swiss Partisans?" from *Allgemeine Schweizerische Militar Zeitschrift* (Switzerland); and "Oil Power and National Policy" from the *Indian Air Force Quarterly*.

Books of Interest to the Military Reader

Reviews of *The State of Latin America* by Germán Arciniegas; and *The Military Genius of Abraham Lincoln* by Brigadier General Colin R. Ballard are included.

The Air Invasion of Holland

Major James A. Huston, *Infantry*

Office of the Chief of Military History, Department of the Army

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The views expressed in this article are the author's and are not necessarily those of the Department of the Army or the Command and General Staff College.

This article was taken from a chapter of Major Huston's study on the airborne team prepared for the forthcoming volume of air-ground studies in the series, the UNITED STATES ARMY IN WORLD WAR II. Requests for permission for reproduction should be addressed to the Chief of Military History, Department of the Army, Washington, 25, D.C.

This is the second in a series of two articles on this subject. The first article of this series appeared in the August 1952 issue.—The Editor.

THE greatest airborne operation of the war, Operation Market, was launched when 1,544 airplanes and 478 gliders carried approximately one-half the strength of three airborne divisions to three widely separated areas and delivered them simultaneously. No German aircraft had intercepted the column, and the supporting air action against antiaircraft positions had been highly successful for the most part.

All the units had not hit their designated drop zones precisely, but, in most cases,

they had been massed and control was established quickly.

GERMAN REACTION

Initial German reaction had been feeble in most places. Although German commanders had considered the possibility of allied airborne landings in Holland, they had regarded such an effort more likely against the German homeland. Increasing aerial activity had suggested the possibility of an attack in the Netherlands. Nevertheless, the timing and the magnitude of the operation did catch the enemy by surprise. The allied air preparation, beginning about 3 hours before the landings, might have disclosed the intentions, but the Germans thought the air activity not greatly above normal, and they thought that the attacks against their antiaircraft positions were attempts to destroy the bridges. German Army Group B had its command post, at the beginning of the operation, in a hotel at Oosterbeek within view of a British landing zone; but the 2 to 3 hours which it took for the British to assemble allowed the German headquarters enough time to move to Terborg.

German Army Group B had a conglomeration of troops with which to face the allied assaults. Its strongest units probably were those assigned to the German Fifteenth Army, but they were committed to holding the Scheldt estuary and the

A well-planned airborne operation, like a surprise beach landing, is likely to meet only light resistance but to have its hardest fighting after the enemy has recovered from its initial shock and reorganized

islands in order to deny to the allies the use of Antwerp as a supply port, and, therefore, were not available to strengthen appreciably the defenses to the east. A weakened German First Parachute Army defended the line against the thrust of the British Second Army; no reserves were immediately available to it. Disposed to protect various key points in Holland were numbers of "combined" units—fortress troops, SS reserves, depleted units from the Eastern front, and naval land units for coastal defense—of the Military District of the Netherlands. The first 48 prisoners taken by the British at Arnhem yielded 27 different unit identifications. This, of course, was the great advantage of airborne operations: that a drop deep behind enemy lines would encounter only weak, disorganized rear area units without an organized defense or sufficient strength for rapid counterattacks. One circumstance, however, spoiled this condition for the British. It just happened that, unknown to the allies, the German II SS Panzer Corps, with its two rather depleted panzer divisions, was in the area north and northeast of Arnhem for rehabilitation. By 1640, orders were going out for the employment of elements of the II SS Panzer Corps as well as for small units of the Military District of the Netherlands.

A well-planned and executed airborne operation, like a surprise river crossing or beach landing, is likely to meet light resistance at first, but to have its most difficult fighting later, after the enemy has had a chance to recover from the initial shock and to organize his forces for counterattacks. The critical time for Operation *Market* would come after D-day.

SUCCESS AND FAILURE

During the next 9 days, troop carrier aircraft flew resupply and reinforcing missions while the troops on the ground fought vigorously to consolidate the nar-

row corridor which would threaten the German position in Holland. An air fleet almost as great as that of D-day brought additional troops and equipment on D plus 1, and later the same day 252 *B-24* bombers of the Eighth Air Force dropped 782 tons of supplies.

When the meteorological staff predicted (accurately) that rain and low cloud spreading across Belgium would affect the southern but not the northern route, the First Allied Airborne Army G3 recommended that all troop carriers follow the northern route on the second lift. Necessary orders were issued within the hour, but fog delayed the take-offs until between 1000 and 1100—the time when the planes and gliders were supposed to be over their drop zones and landing zones.

Second Lift

Most of the 327th Glider Infantry Regiment, and 146 more jeeps and 109 trailers, arrived on the 428 (of 450 which took off) gliders which reached the 101st Airborne Division safely.

The 82d Airborne Division used the 454 gliders assigned to its second lift to bring in the remaining three artillery battalions. They arrived at the landing zones in the midst of a fire fight, and quickly went into action. Germans had attacked from the Reichswald and seized a part of the landing zone. A midmorning attack had driven them off the landing zone, but they still had much of it under fire. General Gavin had sent a message to rear base in an effort to have glider pilots notified to land on the west side of the landing zone. The message arrived too late for new briefings, however, and a number of gliders which landed near the Reichswald came under intense and damaging fire. In the midst of the landings of several hundred gliders on the correct landing zone, 25 gliders of the 319th Glider Field Artillery Battalion continued over the landing zone beyond the Reichswald, and landed

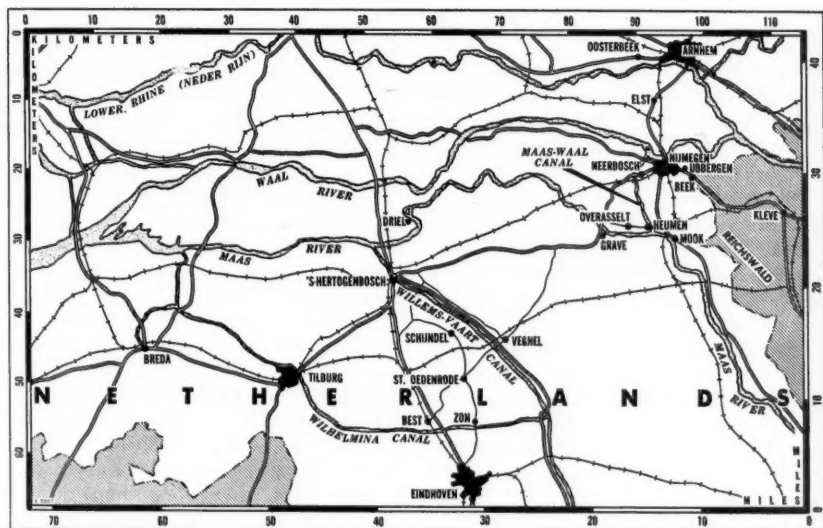
about 5 miles inside Germany; about half the men got back to the division within a few days.

Reinforcements for the British 1st Airborne Division on D plus 1 included the 4th Parachute Brigade in 127 American planes, and other troops in 296 British glid-

ers had flown the second lift. Then bad weather sharply curtailed air operations for four successive days.

101st Ground Action

The force of the 101st Airborne Division which had crossed the Wilhelmina



ers. Another 33 British aircraft dropped supplies.

The Eighth Air Force bombers went in at low altitudes to drop their 782 tons of supplies to the 101st and 82d Airborne Divisions, but variations in their release points scattered the bundles considerably. Since neither enemy action nor poor visibility had hampered the drop, and inasmuch as the bombers flew at the correct altitude, the number of bundles reported to have dropped anywhere from 1 to 8 miles from the drop zone suggested the need for a quick-release mechanism to make uniform the time required to get the panniers out of the ball turret openings and bomb bays.

A total of 1,360 airplanes and 1,200 glid-

Canal at Zon the previous evening—the 506th Parachute Infantry Regiment—advanced toward Eindhoven early on the morning of 18 September. Held up by enemy fire about a mile north of the city, it outflanked the defenses to the east and won control of most of the city by 1300. British reconnaissance patrols had bypassed the city to contact the airborne troops to the north shortly after noon, and the main body made firm contact just south of the city at 1900. Tanks of the Guards Armoured Division passed through Eindhoven quickly and reached the Wilhelmina Canal at 2100. There, engineers immediately began building a bridge. That task completed during the night, the British armored division began crossing at 0615

(19 September). Racing on through St. Oedenrode and Veghel, by 0645 it was approaching the sector of the 82d Airborne Division. While other troops of the 101st Airborne Division fought to strengthen their hold on the corridor, the main axis became a mass of vehicles streaming northward. After an attack on the preceding day, and another on this, to regain the bridge near Best had failed, and now increasing commitments of the 502d Parachute Infantry there threatened to weaken dangerously the defenses of St. Oedenrode, a final assault at 1800 won that objective—and more than a thousand German prisoners.

A third glider lift that afternoon brought in more troops of the 327th Glider Infantry Regiment, antitank guns, and artillery. The antitank guns arrived just in time to help drive off a German tank attack against the bridge at Zon that evening. That night, German planes bombed Eindhoven heavily. When the threat to Zon continued to grow during the night and the next day (20 September), two battalions of the 506th Parachute Infantry Regiment, with British tanks, returned northward from Eindhoven to join with a battalion of the 327th Glider Infantry Regiment in repelling the attacks.

82d Ground Action

Meanwhile, the 82d Airborne Division was being extended in defending itself against attacks coming from the Reichswald in the southeast, and continuing attacks of its own to the north. While other units attacked to clear the landing zones on D plus 1, platoons from the 504th and 508th Parachute Infantry Regiments converged on the canal bridge of the main Grave-Nijmegen highway near Neerbosch and captured it. This bridge was damaged, but would carry light traffic. One company of the 508th Parachute Infantry Regiment returned at 0900 for another try at the main highway bridge at Nijmegen, and,

with the assistance of members of the Dutch Resistance, again got to within 400 yards of the objective. But then, after fighting until 1500 without any further advance, it was withdrawn.

The arrival of the Guards Armoured Division the next day (19 September), by way of Grave (it contacted the 504th Parachute Infantry Regiment there at 0820) and Heumen, added new strength for another assault on the Nijmegen bridges, though strong enemy attacks from the Reichswald still kept other units there defending to the south and east.

The 2d Battalion of the 505th Parachute Infantry Regiment was attached to the British division for a new attempt. Near the center of the city, one company of the 505th Parachute Infantry Regiment, with seven tanks, turned northwest to attack the railroad bridge, while the rest of the battalion and the remaining tanks of the 2d Battalion, Grenadier Guards, together with a British armored infantry company, attacked directly for the highway bridge. Once more the attackers got to within 400 yards of the objective, and then they were stopped. Violent combat continued through the evening and the night, but the German defenses held. The whole success of the operation might depend upon getting that bridge intact.

The corps and division commanders agreed upon a bold maneuver: a river crossing by boat. While infantry and tanks continued to attack the south end of the bridge, the 504th Parachute Infantry Regiment, with the 2d Irish Guards attached, moved up on the west and cleared an area to the river. After instruction in the use of British assault boats, at 1500 the parachute regiment started across about a mile downstream from the railroad bridge. It had only enough boats to take one battalion at a time, but they got across and then moved over several hundred yards of flat ground under fire from an old fort. After some hard fighting, the paratroops

reached the north end of the railroad bridge at 1800. When they reached the north end of the highway bridge, the troops on the opposite side stormed the south end of the bridge. Shortly thereafter the first tank of the Grenadier Guards rolled across. At dawn they would go for Arnhem.

British Ground Action

The delays which had slowed the advance of the British XXX Corps—the defense south of Eindhoven, the building of a bridge at Zon, German attacks against the road near Zon, and the fight for the Nijmegen bridge—were having serious consequences for the British 1st Airborne Division at Arnhem. There, enemy reaction was relatively stronger and swifter than elsewhere. By the time the 4th Parachute Brigade had arrived on D plus 1, several hours late because of the weather, the Germans had had time to build up effective counter-attacking forces. By evening, the Germans had cut the route between the landing zones and the troops at the bridge, and had the British forces cut into three parts—one between the landing areas and Oosterbeek, one in the western outskirts of Arnhem, and one at the north end of the bridge. Moreover, the division had been unable to maintain effective communications. Attempts of the battalions in the outskirts of Arnhem to break through to the bridge the next day failed. Glider elements of the Polish 1st Parachute Brigade arrived in the midst of a fire fight (D plus 2). The Polish paratroops could not go in as planned on D plus 2, or on D plus 3, because of the bad weather. Resupply missions failed on both days when nearly all the bundles fell into enemy hands.

Without supplies, and facing increasingly stronger German infantry and heavy tank attacks, the troops at the bridge were in a perilous position. The houses which they occupied were burned out, one by one, and when they tried to get into alternate positions outside they came under direct

tank fire. No shelter remained for the wounded, and 300 of them had to be surrendered. Out of ammunition, the band of 140 survivors early on 21 September split up into small parties to try to filter back to the main body. None made it. A force, numbering 500 at its maximum, had held out at the key Arnhem bridge for more than 3 days, without resupply, against determined enemy tanks. Now, at almost the hour that tanks of the Guards Armoured Division were starting north from the Nijmegen bridgehead, their last remnants were being eliminated. Other elements of the division continued to hold a steadily contracting area to the west of Arnhem. Holding to the terminus of the Heaveadorp Ferry, they hoped that the Polish brigade might be able to drop there. The bad weather on D plus 3, however, prevented that.

Although the spearheads of the ground forces now had moved northward toward Arnhem, fighting in the south continued as vigorously as ever. Troops of the 101st Airborne Division in turn warded off enemy attacks against St. Oedenrode and themselves attacked and seized Schijndel. That had to be given up, however, when stronger German attacks against Veghel (22 September) cut the main highway and held it until the next day.

As the 82d Airborne Division fought back against strong counterattacks in its sector, all the way from Mook in the south-east to Beek and Ubbergen (east of Nijmegen) in the northeast, the fact that the 325th Glider Infantry Regiment had not been able to join the division became a serious matter.

Polish Brigade

In spite of the unfavorable weather on D plus 4 (21 September), the plight of the British 1st Airborne Division made it almost mandatory to try to get the Polish 1st Parachute Brigade in anyway. American troop carriers took off at 1400 with

about half of the brigade in 110 planes. The loss of the Arnhem bridge now made use of the drop zone originally selected for the Polish paratroops, south of the bridge, impractical. Therefore, they should be dropped near Dreil, on the south bank of the river opposite the area still held by the British. They then could cross the river on the Heaveadorp Ferry. Unfortunately, the weather was so bad that 41 aircraft returned without dropping their paratroops, 3 landed at Brussels, and 13 were missing; only 53 reached the area of the drop zone, and they dropped about 750 men. By the time these troops assembled and reached the river bank, however, they found that the ferry had been sunk, and the Germans controlled the north bank at that point.

British Armor

The attack of the Guards Armoured Division, meanwhile, was bogged down before an effective antitank screen near Ressen. Tanks were unable to operate off roads in this country during the rainy weather, and on 23 September the British 43d Infantry Division passed through the Guards Armoured Division to make an infantry attack toward Arnhem. Armored cars of the Household Cavalry Regiment moved northward from the Nijmegen bridge at dawn, bypassed enemy resistance at Elst, and drove to Dreil to link up with the Polish 1st Parachute Brigade at 0800 (22 September). The main attack was unable to get beyond Elst on the road to Arnhem, but another battalion, mounted on tanks, followed the route of the armored reconnaissance corps and reached the Dreil area before nightfall. More troops, bringing amphibious trucks (DUKWs) loaded with ammunition and supplies for the 1st Airborne Division, arrived in the area before midnight. But the DUKWs could not get through the mud along the river bank, and could not be launched. A few improvised rafts did carry about 50 Poles across the river during the night.

D Plus 6

No troop carrier operations had been possible on D plus 5, but with improved weather the next day, the largest lift since D plus 1 took off. (It also was the day of greatest reaction from the German Air Force.) Gliders took in more artillery and jeeps for the 101st Airborne Division, and the 325th Glider Infantry Regiment was at last able to join the 82d Airborne Division (their gliders landed on what had been DZ "O" near Overasselt). More Polish parachutists flew to the area of the 82d Airborne Division in 41 American aircraft, and British *Stirlings* and *Dakotas*—115 of 123 reached the drop zone—and planes dropped supplies for the 1st Airborne Division, but again nearly all of them fell into enemy hands. That night 150 to 250 more Polish troops ferried across the river to try to reinforce the 1st Airborne Division. However, the British Second Army already had given permission to withdraw all the forces then north of the Lower Rhine should it become necessary.

German Pressure

German forces in the south still had not given up their attacks against the 101st Airborne Division near Veghel. In fact, on 23 September, an enemy force probed between the regiments holding St. Oedenrode and Veghel, and once more cut the corridor. The 506th Parachute Infantry Regiment, with British tanks, raced back southward from Uden and the British 50th Infantry Division attacked from the south. The combined forces were unable to reopen the road until 26 September, but this time it was permanent.

Strong pressure continued against the 82d Airborne Division, and, on 25 September, about 40 German planes bombed the Nijmegen bridge; one hit damaged it. However, by 25 and 26 September, its troops again were attacking to broaden its area along the Waal.

Attempts to reinforce the shrinking

British 1st Airborne Division continued through 24 September. Another 300 to 400 men of the 43d Infantry Division ferried across the river that night, but the next day the XXX Corps made the decision to withdraw the 1st Airborne Division. At first, it was hoped that the 43d Infantry Division might be able to establish a new bridgehead east of Renkum, but finally even that had to be given up. That night, 25-26 September, the survivors of the British 1st Airborne Division, together with Poles and British infantrymen who had only recently joined them, withdrew to the south bank of the Lower Rhine (a few returned the next night).

The air phase of Operation *Market* had about ended. Some plans had been made to use fighter bombers to resupply the British 1st Airborne Division. Believing that the speed, maneuverability, and fire power of the fighter bombers, together with their ability to drop accurately on a small drop zone, would make an effective means for emergency supply, air officers arranged to have *Typhoons* and *Mosquitos* drop supplies in belly tanks released from bomb racks on D plus 8 and 9. However, supplies could not be packed in available containers before the division had been withdrawn.

On D plus 4, intelligence reported a German airfield, not previously noted, in a big bend of the old Maas River bed west of Grave. It was found to be an excellent grass field, but with no markings and poor road access (the Germans had not used it as an operational field).

Immediately, the British I (Airborne) Corps asked permission of Second Army to use the airfield to bring in the United States 878th Airborne Engineer Battalion (Aviation), the British Airborne Forward Delivery Airfield Group (AFDAG), and the British 2d Light Antiaircraft Battery, to be followed by supplies and possibly the 52d (Lowland) Division (Airportable). On D plus 9 (26 September), 209 C-47s

landed the Airborne Forward Delivery Airfield Group and most of the personnel, but not their Bofors guns because poor weather ruled out the use of gliders, of the 2d Light Antiaircraft Battery. All the planes landed, unloaded, picked up American glider pilots to be evacuated, and took off in just 3 hours and 50 minutes. Guiding on a pathfinder team flown in the preceding day, all aircraft arrived safely. The next day, a column of 125 trucks of the Royal Air Force 83d Group (Tactical Air Force) drove up to the field. Apparently, the 83d Group seemed to be under the impression that they had marked and prepared it for their own use. Just as AFDAG prepared to receive much-needed ammunition and supplies, higher headquarters decided to use the airfield as a fighter base because of the noticeable strengthening of the *Luftwaffe* in the area. Now, without any visit or communication with the British I (Airborne) Corps, the 83d Group suddenly arrived to take over the field. Under the circumstances, the 878th Airborne Engineer Battalion (Aviation) and the guns of the 2d Light Antiaircraft Battery were not brought in; AFDAG was removed from the field and dispersed within the Second Army to perform ordinary ground duties.

Extrication

On conclusion of the airborne phase of the operation, the inevitable struggle to extricate the airborne divisions from continuing ground action developed. What remained of the British 1st Airborne Division left Nijmegen for England on 28 September, and those of Polish 1st Parachute Brigade returned on 7 October. Some 2 days later, Headquarters, British I (Airborne) Corps moved back to England. However, the 101st and 82d Airborne Divisions—whose early evacuation had been anticipated in plans and orders—were left behind for several weeks more of intensive combat.

It had become an accepted principle

that airborne troops, because of their special training and equipment and the difficulty of replacing casualties, should be relieved from ordinary ground operations as quickly as possible. Furthermore, such continued employment prevented the preparation of further airborne operations in the immediate future in which they might be needed. At the same time, it could not be expected that a ground commander would release airborne divisions until the tactical situation permitted it, or until they could be replaced. Repeatedly, General Brereton asked that the American airborne divisions be relieved. SHAEF agreed that it should be done as soon as possible; Montgomery held that the situation would not yet permit it. The divisions were not relieved until November. On relief by the II Canadian Corps, 11-13 November, the 82d Airborne Division moved to Sissons, near Reims. Relieved by the British 51st Division on 25-27 November, the 101st Airborne Division moved to Mourmelon-le-Grand, also in the Reims area.

STATISTICS

Operation *Market* was an airborne operation of unprecedented magnitude. A total of 34,876 troops had gone into the battle by air—20,190 by parachute, 13,781 by glider, and 905 by airplane on a prepared landing strip. In addition, airplanes and gliders had carried more than 5,200 tons of supplies, including 568 artillery pieces and 1,927 vehicles.

Total casualties among the airborne troops through D plus 30 (including killed, wounded, and missing) were reported as follows: British 1st Airborne Division, 6,986; Polish 1st Parachute Brigade, 383; United States 82d Airborne Division, 2,909; and United States 101st Airborne Division, 2,938. In addition, airmen of the IX Troop Carrier Command suffered 454 casualties and those of the Royal Air Force 38th and 46th Groups, 294.

CONCLUSIONS

In many ways, Operation *Market* was a remarkable and spectacular success. The nearness which it came to complete and unqualified success made all the more disappointing the failure of the ground forces to link up with the British 1st Airborne Division at Arnhem. The appraisal of the operation by the First Allied Airborne Army was as follows:

The airborne troops accomplished what was expected of them. It was the breakdown of the Second Army's timetable on the first day—their failure to reach Eindhoven in 6 to 8 hours as planned—that caused the delay in the taking of the Nijmegen bridge and the failure at Arnhem.

The airborne operations proceeded not only according to plan but with much less loss than expected. Daylight airborne operations over enemy territory heavily defended by flak have been considered excessively hazardous. "Market" has proved this view erroneous. The great dividends in accuracy of drop and landing and in quick assembly of troops which may be had from daylight operations were enjoyed to the full. Three factors are chiefly responsible: (1) Strong supporting air forces were available and were skillfully employed to knock out flak positions in advance, to beat flak down during the airborne operations themselves, and to protect the troop carriers from hostile aircraft; (2) Excellent staff work so organized the movement of troop carriers, their protection by the supporting air forces, and the drop and landing of troops as to achieve the maximum of surprise; and (3) Thorough training of both troop carrier and airborne personnel produced almost perfect accuracy in the drops and landings. Weapons were rapidly retrieved and units quickly formed up for the accomplishment of their initial missions.

From D plus 2 until D plus 6, weather seriously hampered resupply and reinforcement efforts, yet on the whole they too were accurately effected. It is true that higher rates of loss were suffered in these succeeding days, but this must be, and was, expected in view of increasing enemy resistance.

Actually, to what extent the "breakdown of the Second Army's timetable on the first day—their failure to reach Eindhoven in 6 to 8 hours as planned" was responsible for the failure to reach Arnhem, and to what extent it was due to conditions which the airborne divisions might have altered, is problematical. If the Second Army would have reached Eindhoven in 6 to 8 hours, that is by 2200

on D-day, troops of the 101st Airborne Division would not yet have arrived there to meet them. At that hour, the 506th Parachute Infantry Regiment still was crossing the Wilhelmina Canal at Zon. It also had been anticipated (in General Taylor's letter to General Dempsey) that troops of the 101st Airborne Division would reach Eindhoven within about 5 hours after landing. Moreover, all the bridges at Zon had been blown before paratroopers could seize them, and the wait for engineers to build a bridge would have occurred anyway.

When the Guards Armoured Division did reach Nijmegen, on D plus 2, the 82d Airborne Division had not completed its assigned task of seizing the bridge. Not until late the next day were tanks able to cross the bridge.

Therefore, while it is conceivable that the operation might have been a complete success if the British Second Army could have moved more quickly, it is also conceivable that the ground army could have moved rapidly enough to complete the junction at Arnhem in time if the airborne divisions had been able to capture Eindhoven more quickly, had seized the bridge at Zon intact, and had seized the bridge at Nijmegen before the armored spearheads approached.

Contributing Factors

Many factors contributed to the outcome of Operation *Market-Garden*. A change in any one of them might have brought a quite different result. The operation might have been completely successful if good fortune or insight could have changed any one of a series of conditions which happened to prevail. The outcome *might* have been completely successful *if*: (1) The weather had permitted the Polish 1st Parachute Brigade and the 325th Glider Infantry Regiment to be dropped and landed on D plus 2 as planned; (2) the weather had not delayed the ar-

rival of the 4th Parachute Brigade from morning till afternoon on D plus 1; (3) the German II SS Panzer Corps had not happened to be refitting near Arnhem, or at least if allied intelligence had been aware of its location; (4) communications had been adequate with the British 1st Airborne Division so that the British I (Airborne) Corps and First Allied Airborne Army might have been aware sooner of the seriousness of the situation at Arnhem; (5) it had been possible to deliver the entire airborne strength of the three divisions in not more than two lifts instead of over such a long period of time; and (6) American glider pilots had been organized and trained to make a more effective contribution to the ground combat.

Weather

The arrival of the Polish 1st Parachute Brigade on D plus 2 at the drop zone originally intended near the south end of the Arnhem bridge, at the time when British troops still were firmly entrenched at the north end, could have been decisive. The 325th Glider Infantry Regiment might have provided just the extra strength which the 82d Airborne Division needed to seize the Nijmegen bridge while defending itself against attacks from the south and east. Had the British XXX Corps been able to speed across that bridge as soon as it arrived, it might yet have reached the Lower Rhine in time to relieve the 1st Airborne Division. Or even the arrival of the 4th Parachute Brigade a few hours earlier, as scheduled, on D plus 1 might have been enough for the 1st Airborne Division to consolidate in a strong position before the German troops had had time to build up such strong counterattacks. All these things depended upon the weather, and good weather failed to continue. Yet, an airborne operation hardly could be planned on the assumption that the weather—a condition far more critical for airborne than for ordi-

nary ground operations—would be more favorable than usual for that region at that time of year. Weather was poor, but it was no worse than could have been expected. While the weather encountered could not be termed ideal, it would be termed "above average" in favor of the operation for this time of year.

German Armor

That the German II SS Panzer Corps was refitting near Arnhem was a fortuitous circumstance. It was the kind of condition which might be encountered in any airborne operation. Actually, intelligence had noted that armored divisions might be refitting in the area of the Reichswald, but that seemed to have little direct influence on planning. It is doubtful that a similar notation for the Arnhem area would have made a great deal of difference either, although precise information might have brought some effective tactical air strikes. The possibility of armored counterattack always was of the greatest concern for an airborne division.

Communications

One of the greatest failings in the operation was that of communications. The British I (Airborne) Corps was not aware of the seriousness of the situation of the 1st Airborne Division at Arnhem until 48 hours too late. In response to an offer by the commander of the 52d (Lowland) Division (Airportable) to send a force in gliders to aid the 1st Airborne Division, General Browning had sent (on D plus 5) the following message: "Thanks for your message, but offer not—repeat not—required as situation better than you think. We want lifts as already planned including Poles. Second Army definitely requires your party and intend to fly you in to Deelen airfield as soon as situation allows." If communications had been adequate, the British I (Airborne) Corps might have arranged to accept that offer, or it might have issued orders to the 1st

Airborne Division to move westward to the area of Renkum when such a movement was yet possible; in that area a good bridgehead might have been held until the XXX Corps could cross relatively unopposed. After the operation the First Allied Airborne Army gave a great deal of attention to the correction of communication inadequacies.

Piecemeal Commitment

From the moment that the airborne forces landed, they faced three conflicting tasks: the accomplishment of their assigned missions—a task which became progressively more difficult as the enemy recovered from his initial surprise; the continued protection of drop and landing zones as long as additional air lifts were to come; and the blocking or fending off of enemy reserves moving up to interfere with the mission. All this suggests that airborne troops should be used in mass and the rate of their build-up must be rapid. If all the allied airborne troops used in the invasion of Holland could have been committed on the first 2 days, the final outcome might have been different. A much greater initial force, or very rapid reinforcement, might have made possible complete and permanent control of the Arnhem bridge as well as earlier seizure of the Nijmegen bridge.

A German analysis concluded that the allies' chief mistake was in failing to land the entire 1st Airborne Division at once rather than over an extended period, and in not landing another airborne division (perhaps the United States 17th Airborne Division, known to be in the United Kingdom) in the area west of Arnhem. Given the dispositions of troops, the First Allied Airborne Army did not have at its disposal enough aircraft to carry the airborne divisions in greater mass than it did. Aside from acquiring more aircraft, another possibility might have saved the situation: the basing of at least a size-

ble part of the troop carrier and airborne forces on the Continent. If the operation, at least in good part, could have been mounted from airfields in Belgium and northern France, it might have been possible to fly two lifts on a single day instead of one, double glider tows might have been used for the shorter distance, and much of the bad weather—that which interfered with operations over England but not over the Continent—might have been avoided. Tactical air forces, however, occupied all the suitable airfields. The question of providing adequate troop carrier bases on the Continent was one which would have had to be anticipated in strategic planning long in advance of operations. (The statement of policy which the Combined Chiefs of Staff had issued in February 1944 had emphasized that airborne troops should be kept well forward.) It was another case when tactical air forces took priority over troop carriers to the exclusion of the latter, when closer planning might have provided adequately for both.

Other Problems

Another closely related consideration was that if the British airborne troops had dropped on zones much closer to their objective, they might have seized the bridges and prepared to hold it before the Germans had a chance to move against them.

Another German study suggested that if the airborne operation had been timed to take place well *after* the armored attack on the ground had gained momentum, the results might have been decisive, for then no German reserves would have been left to turn against the airborne troops.

The Glider Pilot Problem

If the glider pilots available to the 82d Airborne Division on D plus 1 had been organized and trained to participate effectively in ground combat, those pilots might have been assigned a defensive sector for the time being on D plus 1 along

the Reichswald front. This might have released parachute troops there for an attack on the Nijmegen bridge. Such an attack conceivably could have resulted in the earlier capture of the bridge and the relief of the British 1st Airborne Division at Arnhem. The British I (Airborne) Corps considered the British system—under which glider pilots were assigned to the Army rather than the Air Force, and were organized into the equivalent of battalions, companies, and platoon, and trained to fight as infantry—was far superior to the American. It reported that the stand made by the 1st Airborne Division, and its subsequent withdrawal across the Lower Rhine, would have been impossible without the assistance given by the organization and training of the 1,200 glider pilots. The commanders of both the 82d and the 101st Airborne Divisions expressed a need for better organization and control of glider pilots after landing. It was a problem which had been anticipated in maneuver, it had appeared in operations in Sicily, Italy, and Normandy, and, after repeated recommendations for improving the situation, the problem was as evident as ever in Holland. General Gavin described it in this way:

... One thing in most urgent need of correction is the method of handling our glider pilots. I do not believe there is anyone in the combat area more eager and anxious to do the correct thing and yet so completely, individually and collectively, incapable of doing it than our glider pilots.

Despite their individual willingness to help, I feel that they were definitely a liability to me. Many of them arrived without blankets, some without rations and water, and a few improperly armed and equipped. They lacked organization of their own because of, they stated, frequent transfer from one Troop Carrier Command unit to another. Despite the instructions that were issued to them to move via command channels to division headquarters, they frequently became involved in small unit actions to the extent that satisfied their passing curiosity, or simply left to visit nearby towns. In an airborne operation, where, if properly planned, the first few hours are the quietest, this can be very harmful, since all units tend to lose control because of the many people wandering about aimlessly, improperly equipped, out of uniform, and without individual or

unit responsibilities. When the enemy reaction builds up and his attack increases in violence and intensity, the necessity for every man to be on the job at the right place, doing his assigned task, is imperative. At this time glider pilots without unit assignment and improperly trained, aimlessly wandering about, cause confusion and generally get in the way and have to be taken care of.

In this division, glider pilots were used to control traffic, to recover supplies from the landing zones, guard prisoners, and finally were assigned a defensive role with one of the regiments at a time when they were badly needed.

I feel very keenly that the glider pilot problem at the moment is one of our greatest unsolved problems. I believe now that they should be assigned to airborne units, take training with the units, and have a certain number of hours allocated periodically for flight training.

General Ridgway, commander of the XVIII (Airborne) Corps did not go along with the proposal to place glider pilots under the command of division commanders for full-time ground training. British practice to the contrary notwithstanding, glider pilots, General Ridgway thought, were where they belonged: in the troop carrier squadrons. They could receive whatever ground training they needed with their associated airborne division. This apparently was no change from the policy which had created the problems which were of so much concern to the airborne division commanders.

Circumstances

While it may be true that a change in only one of a number of unfortunate conditions might have resulted in success for the entire operation, doubtless it is also true that less fortunate circumstances—one of several—might have spelled complete disaster. Success might have been much less if: (1) the enemy, instead of being disorganized as the result of long and rapid retreats, had been in well-organized positions with command and control completely re-established; (2) the enemy air force had been able to come out in greater force; (3) the civilian population had been hostile instead of actively helpful; (4) German troops had blown all

the bridges before allied paratroops could reach them; (5) the weather had been even worse; (6) more reserves, especially in armor, had been available to the enemy; and (7) the British XXX Corps had failed to link up as soon as it did. The airborne commanders pointed out that this had been a "marginal performance," and they expressed the fear that their very success might lead in the future to commitment in less favorable circumstances and the sacrifice of their divisions in an effort beyond their capabilities.

Resupply

The problem of resupplying the troops by air had not yet been solved satisfactorily in Operation *Market*. The airborne commanders were agreed that resupply by parachute should be regarded only as an emergency expedient. The scattered drops meant that the fighting strength of the division had to be weakened to provide recovery details, and many bundles were lost. Gliders, when they could get in, were, of course, much more reliable, but the use of one-way gliders, each requiring a pilot, was an expensive means.

Supposedly, the "approved solution" was to prepare a forward delivery airfield where supplies could be landed by airplane. However, that procedure would depend upon the situation—how long it was expected that airborne troops would need resupply by air, and whether enough troops were at hand to clear and defend a forward airfield. In this operation, one field had been put to use briefly, but then a conflict had developed with the tactical air forces. The British I (Airborne) Corps presented the airborne point of view: "There is no doubt that this conflict is inevitable and changing conditions during the battle (in this case the strengthening of the *Luftwaffe* in the area) may upset prearranged priorities. It is not agreed, however, that priority for all airfields everywhere must go to the tactical air forces on all occasions."

In his report, the engineer officer concluded that one or more airfields should be among the primary objectives in any airborne operation, and that an airfield should not be given a secondary priority after bridges or towns, because the airfield might be indispensable to the holding of other objectives. Co-ordination, then, should be made effective on a high level. This generally had been the assumption in airborne maneuvers, though statements of doctrine had not made that procedure mandatory. General Ridgway thought that the generalization that landing strips should always be constructed was not justified. Better communication might have improved the supply situation. A troop carrier air control party with each division, equipped to communicate with troop carrier headquarters and with the planes, could have prevented some of the drops into enemy territory.

Airborne Doctrine

The airborne commanders, after Operation *Market*, generally were agreed as to the soundness of airborne doctrine as laid down in War Department Training Circular No. 113. General Ridgway wrote: "I cannot too strongly urge the study, the mastery, and the application, by all upon whom devolves any degree of responsibility for the employment of airborne forces, of the principles enunciated in War Department Training Circular No. 113, 9 October 1943."

Probably the operation's greatest contribution was its demonstration of the feasibility, and advantages, of a major airborne operation in daylight under the conditions then prevailing. However, the results seemed to cool some of the sentiment which had been expressed from time to time for a long-range strategic envelopment and prolonged action from an independent airhead.

The Germans found a general opinion among allied prisoners whom they captured

that ground forces must make contact with airborne troops within 3 days. From this the German Army Group B drew the conclusion that far-reaching airborne landings in the future were unlikely. It was expected that the next airborne attacks would be in conjunction with ground attacks or sea-borne landings. The German view was that the next airborne operation would not likely take place behind sections of the West Wall remaining intact, because the allies probably would not think it possible for a ground attack to break through there within 3 days. General Brereton wrote as follows: "[The enemy] has the ability to reinforce any threatened area quickly. Therefore, it is vital that the airborne thrust be joined with the ground thrust in a minimum of time to avoid undue losses. The armament of airborne troops does not permit sustained operations against a prolonged attack by heavy weapons and armored forces."

Operation *Market* unquestionably was the best-planned and the most skillfully executed large-scale airborne operation thus far. The experience of earlier operations played an important part in that achievement, but it is not unlikely that the existence of an over-all co-ordinating agency in the First Allied Airborne Army helped in large measure to make it possible. This centralized control of all airborne and troop carrier forces, together with the direction of all associated air forces, was the culmination of a trend which had been developing since the Sicily operation.

Faulty Organization

Faulty organization still seemed to be evident in the airborne division. Both the 82d and the 101st Airborne Divisions had continued to depart from the published tables of organization and equipment in effecting a more practicable organization. Before the Sicily operation, the 82d Airborne Division had been authorized to change its organization to include two

parachute and one glider infantry regiments. When it came to the United Kingdom, the 101st Airborne Division still had the one parachute-two glider infantry regiment arrangements. However, for the Normandy operation the 2d Battalion, 401st Glider Infantry Regiment (the glider regiments had only two battalions), was attached to the 325th Glider Infantry Regiment, 82d Airborne Division, and the remaining battalion was attached to the 327th Glider Infantry Regiment, 101st Airborne Division.

Thus, each division had, in effect, one three-battalion glider regiment. Then two additional parachute regiments had been attached to each division for that operation. Except for one of the parachute regiments for the 82d Airborne Division, these attachments had continued for the Holland operation so that both had three parachute and one glider infantry regiments, each of three battalions. Modifications which the 82d Airborne Division had made included: (1) the formation of a provisional fourth company in the engineer battalion to support the attached parachute infantry regiment, (2) the conversion of one of the three antiaircraft artillery batteries of the airborne antiaircraft artillery battalion into an antitank battery so that the battalion had four antitank and two antiaircraft batteries, (3) the organization of a provisional reconnaissance platoon, and (4) the organization of a provisional parachute maintenance company from the packing sections which the various parachute units were authorized. The division artillery included one parachute and three glider battalions. The 376th Parachute Field Artillery Battalion and the 456th Glider Field Artillery Battalion each had three firing batteries, each with four 75-mm pack howitzers; the 319th Glider Field Artillery Battalion had two firing batteries of six 75-mm howitzers, and the 320th Glider Field Artillery Battalion had two firing batteries of six

105-mm *M3* howitzers. The 101st Airborne Division had made similar modifications.

Unit Disposition

An important factor which taxed the division strength and brought out other shortcomings in tables of organization was the disposition which the division commander found it necessary to make for the Holland operation as well as for the earlier missions. This disposition was as follows: (1) an element of the airborne division had to remain in the billet or bivouac area to guard and maintain the housing area, certain motor vehicles, and organizational equipment not needed for the operation; (2) a rear base installation to handle details at the departure field; (3) a sea-borne (ground if airborne bases had been located on the Continent) echelon with heavy equipment which could not be air-transported and which was to join the division after contact with attacking ground troops; and (4) the airborne echelon, which in turn was divided into the normal rear installations of a division and the forward elements for combat. Moreover, the nature of the combat in which airborne troops engaged demonstrated other needs in organization.

On the basis of this experience and the repeated recommendations of division and corps commanders, the First Allied Airborne Army in November asked that a new table of organization and equipment be approved for American airborne divisions. In general, these recommendations repeated those which had been made, and disapproved by the War Department on the grounds of the shortage of manpower, after the Normandy operation, and they represented the principal changes which the 82d and 101st Airborne Divisions had in fact made before being committed to combat.

Predicated on the assumption of two parachute infantry regiments and one glider infantry regiment for the division,

the recommendations sought to bring division organization into line with that arrangement and to overcome shortcomings which had become evident in the Holland and Normandy operations. Because of the wide separation of the division in three or more echelons, and the need for liaison with each part, with higher headquarters, and with the troop carrier command, airborne officers asked for an expansion of the division general staff. An air support party also would be added as an organic part of the staff. Airborne warfare had raised major problems in civilian population control, traffic control, and handling prisoners of war; consequently, a traffic section and an additional police squad were asked for the military police platoon.

The nature of airborne operations in unfamiliar terrain against potentially greater forces demanded rapid reconnaissance before the enemy could organize a counterattack; therefore, airborne officers asked that their division reconnaissance platoons be authorized in a table of organization. A command post platoon was asked for addition to the division headquarters company. Airborne officers had found the basic doctrine of triangular employment tactically sound, and, therefore, again recommended a third squad for the parachute infantry platoon, and a third battalion for the glider infantry regiment.

They recommended the substitution of an additional parachute engineer company in the engineer battalion in lieu of a glider company, and the addition of a third platoon to the glider infantry company in order to conform to the recommended infantry organization. Other recommendations were for the reorganization of the signal company to that found in a standard infantry division, the addition of a

litter bearer section to each platoon of the medical company, an additional transportation section for the quartermaster company, and the addition of a second parachute field artillery battalion as direct support for the second parachute infantry regiment and the equipping of the glider field artillery battalion for general support with 105-mm *M3* howitzers, in lieu of 75-mm pack howitzers. In December, the War Department asked that an officer from the XVIII (Airborne) Corps be sent to Washington to discuss the proposed changes in the airborne division tables of organization and equipment. For this mission, the corps commander chose Major General Maxwell D. Taylor, commander of the 101st Airborne Division.

Success or Failure?

Although the failure at Arnhem had tended to overshadow the real success of the airborne and troop carrier units themselves, Operation *Market* had demonstrated the feasibility of mass airborne operations in daylight. The mission was not the kind which would have appealed to airborne officers as the most desirable kind, for the units on the ground had been widely separated along a narrow corridor which made consolidation and holding difficult. However, on the whole, the airborne divisions had gained their assigned objectives, and they had demonstrated something of the potentially decisive influence which airborne operations might have. The effectiveness of the joint operation, aside from the planning and co-ordination which had gone into it, was a tribute to the training of the participating units. As the troop carrier report put it, "Training should never be allowed to bog down when results are so gratifying."

Notes on the Tactical Employment Of Atomic Weapons

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The views expressed in this article are the author's and are not necessarily those of the Department of the Army or the Command and General Staff College.—The Editor.

AS LONG as fissionable material remained scarce, the ability of the strategic air force to deliver atomic bombs on key targets in the enemy heartland was the central core of American war planning. Now that this basic shortage is being overcome, additional concepts for the employment of atomic weapons must be examined. The United States Army must learn to handle these new weapons in both attack and defense as well as to prepare to receive hostile atomic blows. This prospect poses many new problems to commanders and to troops. The swift technological progress in new types of atomic weapons and missile delivery must not outpace the development of tactical doctrine and procedures for their employment.

While we accept as fact that the advent of atomic missiles to the battlefield changes no principles of war nor fundamentals of tactics, we may reasonably expect that many *applications* of these principles and fundamentals will be subjected to different degrees of variation. Organization, equipment, staff procedures, and the handling of units on the atomic battlefield will differ from those of World War II just as the machine gun in World War I profoundly affected the land warfare of that period. Thorough testing in field ma-

neuvers, not theory, should determine the nature and extent of all changes.

Success in atomic warfare calls for a careful analysis of the weapons' effects upon armies operating in the field, and upon the installations and services supporting them. It demands thorough indoctrination and training of our own forces, from general to private, so that these troops will be prepared to exploit to the maximum our use of the weapons, and, at the same time, to minimize the effects of hostile atomic weapons used against them.

Before we attempt in the space of a single article to outline the immense task involved in these simple statements, let us first consider the more general questions—What is the place, if any, of atomic weapons in tactical warfare?

The Tale of Two Cities

The destruction of two Japanese cities by the only two atom bombs delivered against an enemy has inevitably overemphasized that particular method of employing the world's most powerful weapon. A future major war may again witness the devastation of industrial centers by atom bombs, but it is highly improbable that such a war will be decided solely by similar attacks or that city bombing will comprise the predominant wartime use of the new weapon.

A parallel exists in the history of artillery, long used in siege warfare to batter down castle walls, before it developed

into an antipersonnel weapon. Even in World War II, artillery shattered cities which fanatic Nazis refused to surrender despite encirclement. Manifestly, it was sound to rely upon fire power to reduce the casualties that direct assault would have cost us.

Broadly considered, that was the use made of the atom bomb in 1945. Japan was hopelessly encircled, with all chance of victory gone. Yet, fanatic resistance to the scheduled invasion was certain. Hence, the bombing of Hiroshima and Nagasaki. A beaten foe was jolted into realizing the futility of further resistance. In both instances, if the means were bloody, the actual loss of life was less than assault would have entailed.

These considerations, sound as they are, do not constitute the complete case for the selection of Hiroshima and Nagasaki as initial targets. Had the first bombs been ready a few short months earlier, might not their targets have been Iwo Jima or Okinawa? Would not the destruction of a concentrated defensive position with its powerful garrison, determined to inflict severe casualties upon our troops, have been preferable to wiping out two cities which were of limited military importance in themselves?

Atomic Fire Power

Probably the strongest arguments favoring a metropolitan target lay in the

the bombardier when "ground zero" was the center of a populous city.

Since that day, the family of atomic weapons has progressed. Commanders of the near future will have a choice of bombs and delivery means to reach varied types of targets with even greater destructive power available in one package. The accuracy of the original means of delivery, the high-altitude heavy bomber, exceeds the possibilities of 1945. In addition, delivery by fighter planes, by artillery shells, free rockets, and guided missiles is in certain prospect, although dates and details are guarded by security provisions.

No longer is the Strategic Air Command the sole military agency concerned with the offensive use of atomic weapons. Past is the time when only cities, industrial complexes, or large military installations comprised the entire list of "suitable" targets. It is now time to consider the potentialities of atomic warfare upon armies, and their subordinate units, in the field.

Fire and Movement

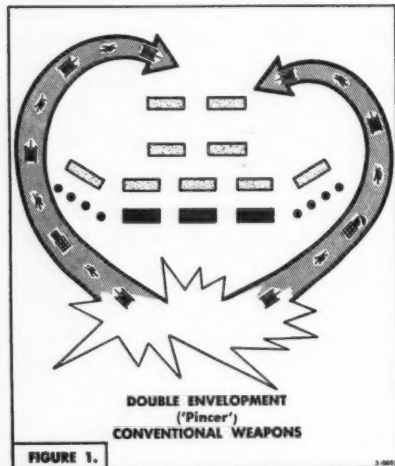
The classic concept of "fire and movement" for seeking the tactical decision on the battlefield began with the revolutionary armies of the French Republic and has gone unchallenged since its exposition by Von Clausewitz. The effect obtainable by maneuver dictated all battle plans for the decisive conflicts in a century of warfare. The "fire plan" was devised to support the

The Army's chief concern should be the employment of, not merely defense against, atomic missiles, for this powerful weapon can become the bulwark of an active defense against numerically superior forces

existing technical difficulties of assuring a hit on any target smaller and less surely defined than a city. Bomb delivery from heights above 30,000 feet had grave limitations 7 years ago. There was little chance of designation errors by intelligence or of mistaken identification of aiming point by

movement to which it was subordinated. Hence, the common phrases, "base of fire," "support fires," and the like. Even those terrific concentrations of fire that preceded the Normandy landings were essentially aids to, not instigators of, the maneuver scheme.

The tremendous concentration of fire power in a single package brought about by atomic weapons suggests possible alterations in this accepted idea. Cases may arise in which the unusual potency of that "fire power" itself governs the adoption of a particular maneuver. A frontal assault, tempting as the most direct route to the



enemy's vitals, but cast aside as a bloody insanity with conventional weapons, may now become the cheapest route after atomic weapons open the way. The forbidding concentration of men and guns that bar our way may conceivably comprise the most remunerative atomic targets in the enemy's entire position. Instead of searching out the opponent's weakest point to assault, the atomic missile-equipped army may deliberately shatter his strongest element with their blasts and exploit that destruction by swift columns of armor and following infantry. Weaker elements of the hostile force then will fall easy prey.

Offense—Atomic Style

Devising plans and procedures and making preparations for attacking the enemy

with atomic weapons involves all the difficulties connected with predicting results of new and untried instruments of warfare. For one thing, much essential factual data are still incomplete and in some instances actually contradictory. For another, psychological reactions to the shock effect of atomic weapons are unpredictable, but could, conceivably, be more catastrophic than the physical damage. Panic and mental confusion have won as many battles as bullets.

New Units

It should be reasonably assumed that all military forces will, in the near future, be adequately instructed in the capabilities of their atomic weapons. In addition, it is to be hoped that our troops will have acquired a sound, unexaggerated knowledge of those weapons' threats to themselves, a knowledge which reduces radiation hazards to their actual minor role. Yet, even with military education in atomic warfare, specially trained and equipped units will be necessary.

New Staff Specialists

New units will be required for assignments connected with safeguarding and transporting atomic missiles as well as their actual delivery against the enemy. Atomic staff specialists of two types, differentiated by both education and mission, also will be needed. One staff group will be technicians, scientifically trained, to advise the commander in the selection of fuze settings, height of burst, bomb power, and delivery methods with a view to accomplishing the maximum effect upon the target, or targets, of the commander's choice. The second type will be general staff officers, specially trained in the tactics of atomic warfare, to recognize and select priorities among targets. Their task will be to advise the commander, as the artillery commander now advises regarding conventional fire power, concerning the manner in which his atomic weapons

should be integrated into an operation to ensure their maximum contribution toward the over-all mission.

The tasks allocated to atomic weapons in the scheme of maneuver primarily will be those which, either by their nature or magnitude, cannot be performed effectively by conventional weapons. The limited numbers of atomic missiles, as well as the fact that each missile might influence the course of a battle as much as an entire division, mark target selection as a problem of vital importance. It is probable, therefore, that such authority will not be delegated lower than the level of the corps commander if, in fact, such discretion is not retained by the army commander.

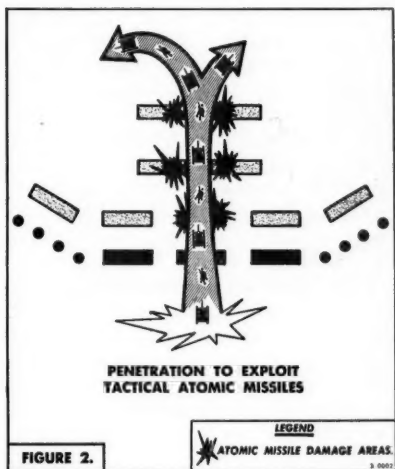
What Is a Target?

Before commanders are able to render a decision concerning a specific target, many preliminary steps must be completed by numerous agencies and staff echelons. However, no selection can be better than the intelligence provided the staff personnel charged with this vital assessment. With the enemy's picture at hand, the process of choice begins. In a particular situation, the staff adviser must ask: Should the atomic plan (as well as plans for other supporting weapons such as tactical aviation and naval gunfire) be guided by the commander's existing scheme of maneuver in order to afford the maximum assistance to that plan? Or, might it be better to hit the enemy at his strongest point, that is, where his troops were most heavily concentrated, rather than at a "weak" spot covered by fewer troops?

Should the enemy risk a large number of men and equipment in a relatively small area, the casualties and destruction that atomic attack might wreak upon them could be sufficient to demoralize the survivors, making them easy victims to swift, exploiting armored columns following up the atomic blasts. The lesser enemy concentrations could then be dealt with by

conventional means. "Economy of force," "surprise," and "the objective" (this last properly the "destruction of the enemy's will to fight" instead of the often heard "destruction of the enemy") have all been served, and ably so.

Divisional participation in long-range target selection is unlikely. Still less prob-



able would be divisional authority to expend atomic missiles. Permanent (fixed) targets such as defiles, fortified localities, communications junctions, and distant ones such as reserve bivouacs and supply depots will be selected or rejected by higher echelons before they become of tactical interest to a division. Yet, there may be occasions when targets of the utmost importance, which, because of their transitory nature, have escaped detection at higher level, are discovered by division intelligence agencies. It is, therefore, vital that all reconnaissance and intelligence elements of the division be educated to recognize potential atomic targets. No less important are prescribed rules, usually termed standing operating procedures (SOPs), for the swift evaluation and reporting to next higher level of all infor-

mation (intelligence) which indicates targets worthy of atomic attention.

Terrain and Weather

Terrain and weather must be considered in target selection. The major influence of weather on the effect of atomic missiles enhances the military value of reliable weather reports and forecasts. Fog, haze, and rain reduce the burn effect (ordinarily the most powerful of the weapon's threats against personnel in the open). Rugged terrain, on the other hand, can limit all three of the atom bomb's lethal effects; blast, burn, and instantaneous radiation. However, the hills or ridges must be high enough to "shadow" a locality against the slant line from the point of burst (normally considered as approximately 2,000 feet above the ground).

Blast effect of a bomb exploded over, or in, a terrain compartment is actually increased by "echoes" from the compartment walls. This is *not* true of the burn effects. Radiation is "diffused" by collision with the ground but not to an extent requiring consideration for field operations.

Consideration of the Situation

Atomic missile targets must be selected after considering the existing tactical situation, particularly the comparative strengths of opposing forces; the availability of atomic weapons to both forces; and the missions of these forces. The lowest order weapon available which will accomplish desired destruction always must be used. Consequently, it is impossible to state categorically, in advance, that a certain number of troops, a concentration of so many tons of supplies, or a command post of a specified echelon are "profitable" targets.

No Dollar Economy

Statements have appeared in the public press emphasizing the relative "dollar economy" of atomic weapons compared with conventional means of inflicting casualties upon the enemy. "So many million

dollars worth of A-bombs will kill more foes than 10, 20, or 100 times that sum invested in artillery shells or ordinary bombs." Or, in another form, "A-bombs costing X millions can destroy many times that value in supplies." Whether or not either of these is accurate remains an academic question to the combat commander. He will use tactical atomic weapons because of their availability and effectiveness, not because of the dollar value of material destroyed compared with the cost of the missile. Perhaps our enemies have an entirely different scale of costs from ours. The "value" of an ammunition depot to an army varies immeasurably according to how many similar depots that army may possess. And, finally, what is the "value" of human life on the battlefield? No, we cannot use a dollar sign yardstick in selecting targets for atomic weapons!

The tendency to regard the tactical employment of atomic weapons in the same light as artillery preparation or counter-battery fire also is misleading, although in a broad sense both functions may be performed by the new weapons. Atomic stock piles are likely to be too limited, the missiles too powerful for expenditure on "area targets." Except in instance of dire emergency, authorized by proper authority, atomic missiles will be delivered only against accurately located targets, the importance of which, in the specific situation, have been carefully weighed.

Therefore, the atomic missile will be extremely difficult to deliver against targets of opportunity. The rapid pace of many of the campaigns in the last war caused numerous instances where front-line commanders located "opportunity" targets for long-range artillery or tactical aviation. Yet, because they failed to get both this information and support requests through fast enough and with sufficient clarity, they failed to receive the assistance in time. The seesaw campaigns in Korea

have doubtless developed comparable examples.

Concentration

The delivery of atomic missiles against an entrenched enemy prior to our assault is well within present staff capabilities. The principal risks involved will be hostile atomic capabilities to make a shamble out of our assembly areas, if they are too concentrated, and if, again, the enemy can discover them in time. We will know with reasonable accuracy enemy locations. Our front-line units, precisely plotted in operations maps, can dig in for protection, and occupy their deep foxholes at the exact moment. (We hope to time our blasts to catch as many of the enemy in the open as possible.)

On the defense, staff planning looms much more complicated, particularly in case of a hostile penetration. Positions of friend and foe alike will be vaguely defined. Obviously, the atomic strikes cannot fall in such close proximity to our own troops as artillery shells do. "Opportunity" targets will predominate although localities where hostile concentrations might logically be anticipated should be "zeroed-in" ahead of time. Our defensive maneuvers should particularly seek to compact the enemy within those small areas.

A third, and most unpleasant, prospect for atomic age staffs is the task of redeploying our reserves, rallying stricken units, fast enough to counter the assault almost certain to follow an enemy's atomic strikes. Logically, current maneuvers are field testing such problems and gaining practical experience in their solution. Atomic weapons, like every new tool of war, must be thoroughly understood and mastered before they are used in battle.

'Radiation Hazard' Debunked

Presumably, Army possession of atomic artillery, guided missiles, or free rockets will speed up the period between decision as to targets and the moment the missile is actually "on the way." However, it is

not likely, even for preplanned missions, that this can be cut to the bare minimum customary with ordinary gunfire. Long-range guided missiles may turn out to be Air Force weapons, complementing that service's strategic bombing mission, and as such would be exceptions. In general, however, guns, guided missiles, and rockets appear to be Army weapons. Their tremendous power will require close control by senior commanders. Their complicated, highly technological logistic problems will necessitate special measures. Safeguarding the stock pile of missiles, guarding such missiles and maintaining secrecy during transit from depots to firing positions, and the safety precautions in handling them to prevent a premature explosion on friendly territory all represent major new requirements in ground warfare. Battalions organized to fire these weapons will need both security and logistic support greatly in excess of that furnished today's artillery from the headquarters to which they are assigned.

Such units will seldom be assigned to divisions or even receive fire missions from division commanders. Limitations of range, however, may result in their occupying positions within the rear limits of the divisional area. In order to be prepared for this last possibility, division commanders and their staffs must be conversant with general procedures and techniques of security, including deception measures to conceal firing positions, as well as the logistic problems of weapons and missiles. Obviously, they also must be completely informed as to the time and nature of all fire missions ordered by higher authority, for these may affect the security of their divisional area.

Friendly troops in deep foxholes, trained to look away from the direction of the explosion, will be safe a mile from ground zero, for the "nominal" (20 KT) bomb. This "safe" distance may be reduced by additional data being collected from tests

such as the recent maneuvers in Nevada. Tank crews protected by their armor can be closer. Equipment and supplies will be undamaged at distances permissible for personnel.

Fortunately for the quick follow-up, no radiation dangers exist for our troops who advance swiftly in the wake of an atomic air-burst explosion. (After-explosion conditions *within several hundred yards* of ground zero for ground and underground bursts are not definitely known. Even in these explosions, however, residual radiation should be of brief duration *outside* of the radius of the clearly discernable crater lip.)

Handicaps to prompt exploitation will be more frequent because of fires and debris from an explosion. Roads may be blocked and thick, dry brush may be ablaze, but in country open enough to normally permit troop movement, no serious obstacles are foreseen. Plans should be made for rapid movement in complete disregard of the hitherto exaggerated "radiation hazard." Contingency plans should assure cross-country mobility in case roads are blocked or for engineer assistance to clear blocks.

A possibility of atomic warfare is the hostile use of mines, atomic or conventional, to bar an area where our advance is anticipated. The effect of atomic explosions on buried mines, atomic or conventional, is not definitely known. Even if atomic explosions fail to destroy enemy mines, their delaying effect upon our advance will be minimized by cutting channels through mine fields while hostile covering fire is absent because of our atomic attack.

This consideration applies with equal force to all forms of obstacles which may be encountered in the advance, either natural or artificial. The adage that "an obstacle not covered by fire becomes only a nuisance" is truer than most aphorisms.

Division plans for exploitation should emphasize the urgency of passing all obstacles while the enemy is still shaken and incapable of laying down effective fires.

Defense Plus A-Bombs

General Omar Bradley recently said, concerning the defense of Western Europe: "The atomic bomb will make a formidable defensive weapon" if the aggressor is compelled by terrain and the efforts of ground troops to "channel his attack along the natural routes of march."

By causing an aggressor army to change its steam-roller tactics, the Western armies' superiority in mobility and control can be made to pay off. In short, the atom bomb makes it possible to resist aggression with a relatively smaller number of land forces. However, these units must consist of alert, highly trained fighting men, equipped with the most effective means of modern warfare. Such hard-hitting land forces, backed up by adequate naval and air support, can defeat in detail what remains of the atomic-crippled enemy.

However, the tactical use of atomic weapons is not a cheap and easy solution of our immense security task. The United States and its allies still need many divisions backed by strong tactical air power. The atom bomb in land campaigns can make it unhealthy for an aggressor to mass his forces, but it will not eliminate his armies.

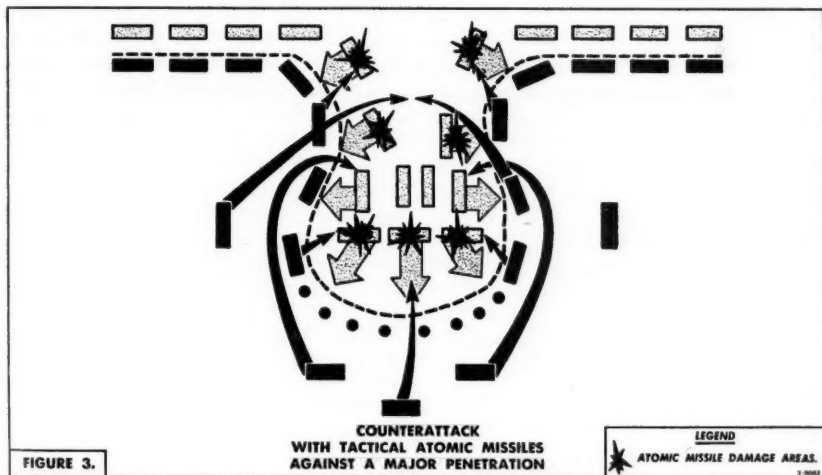
Atomic missiles, like their comparatively miniature counterparts conventional artillery, are primarily offensive weapons in contrast to mines, which are entirely defensive. Yet, despite a given weapon's tactical classification, it can often possess a different strategic potential. Certainly long-range bombers are strictly an offensive striking force. Nevertheless, since the United States strategic air force will be employed only in retaliation against aggression, it at once becomes a prime

weapon of American defense. The same is equally true of tactical atomic weapons which now open startlingly new vistas for outnumbered defensive forces.

The use of this weapon by defending armies might seem to involve contradictions. Concentrations, either of men or material, are prerequisites to justifying the dispatch of atomic missiles. Apparently, we must remain dispersed while hitting a concentrated foe. Is that possi-

flank its deadly menace and dispose of its crew with a hand grenade or a sharpshooter's rifle. In brief, the machine gun must be guarded by enough troops to prevent flank or rear attack from infiltrating individual foes against which it is helpless. Thorough guarding raised the concentration of defenders to a point where attackers' artillery could take its toll and again open the path for flanking skirmishers.

Even the "solid" front, from Switzer-



ble? The immense striking power of the atomic weapons appears neutralized on a battlefield where both contestants possess it. The massing of force to achieve decisive victory exposes that force to the destructive effects of its opponents' atomic missiles. Yet, dispersed troops cannot apply enough force to defeat the enemy.

The apparent contradiction is explained by recalling the belated success of World War I generalship in dealing with the machine gun. Against frontal attack by infantry, the machine gun had been almost impregnable. Dug into field fortifications, it was hard to destroy by artillery. Yet, a Sergeant York could, single handed,

land to the Alps, was not impenetrable to determined, infiltrating storm troops and yielded to the German new style assault in March 1918. Months later, when American armies plunged into the forests of the Meuse-Argonne, maneuver broke the machine gun's absolute supremacy and restored to skillful leadership the possibility of wresting decisive victory. Advances could no longer be estimated mathematically beforehand; so many hundreds of casualties for so many yards forward. War's principles, which were merely overlooked, not invalidated, were again acknowledged. Speed and skill of maneuver combined with a superior intelligence serv-

ice would seem the key to success in tactical atomic warfare.

Renaissance of Generalship

Many writers concluded in the aftermath of World War II that, because of the increased mechanization of armies and the immense logistic effort to support them, generals were only planners, not leaders. The general's role—so we were told—had become that of a corporation board chairman. Had that conclusion even been true, the advent of the tactical A-bomb on the battlefield would kill it.

Atomic warfare will tax generalship as never before, by vastly enhancing the price paid for each failure or, conversely, holding out hitherto unbelievable rewards for "outgeneraling" the enemy. The atomic age commander, whose army faces superior foes and must assume the defensive, has the difficult task of disposing his troops so that their strength is great enough to force the attacker to mass if he would advance, yet held sufficiently dispersed to preclude fatal damage by the enemy's atomic missiles which will probably precede his assault.

Maneuver is not apt to be again ignored as it was in World War I or in medieval sieges. Were the establishment of "unbroken fronts" possible with available manpower and material, modern conflict still offers the possibility of airborne or sea-borne envelopments. And it will be in the maneuver—normally on the most extensive scale—accomplished by the genius of leadership which conceives it and the mobility (including discipline and training) which executes it that combat between two atomically armed hosts may well find victory or defeat.

The next war's commanders will desperately need swift, accurate intelligence; from reliable estimates of enemy atomic capabilities and intentions to spot reconnaissance of hostile weapons which might deliver the missiles. However, even with

those imponderables adequately met, the defending general has barely begun the estimate which leads him to his decision. They will aid him in the successful disposition of his own troops. They will not inform him as to the means by which the enemy's superior strength can be reduced to a point at which a counterattack can be launched with hope of decisive victory. This latter "uncertainty of battle," as Von Clausewitz expounded more than a century ago, has not changed in nature. It has only become more complicated when the traps into which he would beguile his attacker are no longer sunken roads, enfilading canister, or concealed cavalry to charge an exposed flank. The traps are now situations under which the defender may loose atomic missiles with disastrous results upon the unwary, if superior, numbers and equipment of his enemy. The classic example whereby Hannibal destroyed a superior Roman army at Cannae still typifies the ultimate in tactical art. Only the nature of the enticement and the method of the kill will take on new forms, since the weapons with which the soldier fights have been altered beyond all comprehension of Hannibal's swordmen.

Calculated risks must be taken. That term cannot be permitted to cloak ignorance of the real nature and extent of those risks but should emulate the careful reckoning of a Lee at Culpepper detaching his "right arm" Jackson to Manassas Junction while he faced Pope's Yankee host with a fraction of the Confederate Army.

Some portions of the atomic age battle commander's defending force must inevitably be more concentrated than would be "safe" should atomic blows befall them. Those portions must either be concealed, too mobile to be dangerously hit, or so deeply dug in that their concentration is reduced, in terms of atomic attack. The "dispersion" cure-all for protection against the new weapons is meaningless until analyzed and applied to a specific set of con-

ditions. For example, direct a replacement depot commander to "disperse" his camp so that a nominal (20 KT) bomb cannot cause more than 2,000 casualties out of his 16,000 men. With World War II type construction, that requires a camp of 64 square miles minimum, a square 2 miles on a side for each 2,000 men. Such an installation would be prohibitive to build, impractical to operate. Yet, if personnel were required to live in tent covered, deep foxholes, it could be safely reduced to less than half size. Camouflage, concealment, and "calculated risk" could permit further concentration.

Engineers can build very few atomic bomb-proof installations. The next war's logistics as well as its tactics must make adjustments to new weapons. To cite an extreme example, overseas forces may leave the Zone of Interior from beaches in addition to having to land outside of established ports upon their arrival over-

seas if atomic bombing turns ports into death traps.

Conclusions

New, often startling, aspects can be discovered in every phase of operations in atomic warfare. Yet, a few conclusions must already have become obvious. Atomic weapons are now suited to battlefield use. Commanders up front, as well as those far back, must deal with them, recognize their potential power to help us snatch victory from superior numbers or to encompass our ruin. We must respect, but not fear, the new weapon. Possessing the headstart in numbers and technological development, we need only ensure that we use them wisely, and protect ourselves against them soundly, not hysterically. Atomic warfare is a challenge to both American leadership and science, which, boldly met, will neutralize an aggressor's reliance upon reckless expenditure of lives to pound out victory in land warfare.

Let me emphasize that the major air arm of today is composed of two elements—the atomic bomb and the airplanes to carry these atomic bombs.

This atomic bomb is the greatest and most powerful weapon that man has ever had in his hands and the Soviets are quite alert to that fact.

They have built up their atomic capability impressively, and this for all the prognostications of a few years ago that they lacked the scientific and engineering ability to do so.

I believe that any complacent assumption that the Soviets are not capable of developing atomic weapons—excellent in quality and in substantial numbers—is a very dangerous assumption indeed.

Secretary of the Air Force Thomas K. Finletter

What's the Score?

Colonel Buel T. Rose, *Adjutant General's Corps*
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IT IS a basic characteristic of Americans to want to know the score. Newspapers play up the score in large black headlines whether the contest be a baseball game or an election. Radio and television sports announcers, recognizing the importance of informing their audiences, repeat the score over and over again during their broadcasts. In no segment of American life does this hunger to know the facts reach greater heights than in the armed forces. One has only to observe troops at mail call to get the full impact of the hunger for information about the civilization in which we live, and the events which are shaping our lives; a hunger which is not born of military directives.

During World War II, the question most asked during the visit of staff officers and commanders to either subordinate or higher headquarters was "What's the score?" Of course the question was not always phrased in this way, but it might well have been, because the information desired was actually, "What's the situation in this war as you people know it at your level of command?"

Personnel at the subordinate headquarters felt that the visitor should have information that they did not have access to and personnel in higher headquarters wanted the news which had not as yet filtered up to them. While officially staff visits were usually for the purpose of supervision, co-ordination, or assistance to

the unit visited, in the final analysis, these visits were primarily for the purpose of getting news. The staff officer wanted the score, insofar as his particular staff activities were concerned, at the level of the unit visited.

We make a mistake if we assume that the hunger for news is limited to enlisted personnel. While it is true that our formal information program in the Army is aimed primarily at giving troops information, the successful leader never loses sight of the fact that it is of even greater importance that he ensure that his staff and subordinate commanders are kept informed. Unless this is done, the chances of the troops getting the word are remote. The hunger for news is just as great among the individuals at all levels of command and staff as it is among the individual members of a squad.

Historical Background

The idea of a troop information program is not new, although the formal program we know today came into being during World War II. Great military leaders, since the beginning of recorded time, have recognized the need to give their troops the word. A part of their greatness may be attributed directly to the fact that they appealed to the minds and hearts of their men. Caesar deemed it wise, before crossing the Rubicon, to explain to his troops *why* he was defying the Senate's orders. There are many instances recorded in history where soldiers who were well in-

formed of the cause for which they were fighting were able to defeat better trained, more experienced, and numerically superior forces.

Another First

Among the numerous firsts attributed to George Washington must be included the information program in the American Army. Just as he is recorded in history as the Father of His Country so, too, must he be considered the father of the information program in the Army. Washington realized the importance of keeping his army informed and he wrote many articles for this purpose. In the trying winter of 1776, he commissioned Thomas Paine, author of *Common Sense*, to write a pamphlet which would "arouse the people." As a result of this commission, Paine wrote the *Crisis* which stirred our forefathers with an honest zeal of patriotism much as the series of films "Why We Fight" inspired American soldiers during World War II. Regardless of the implication raised by historians regarding Thomas Paine's political beliefs, there is little doubt regarding the contributions to the revolutionary cause by his writings for the information of the soldiers of our Revolution Army. Indeed, he may be called the first troop information officer of the American Army. The credit for realizing the imperative need for informing his troops on subjects vital to our struggling

issues of the day. It is recorded that at one such meeting he caused the Declaration of Independence to be read to them. The reading was followed by a discussion period during which all joined in talking over the grounds and reasons for the war. We also know that on Christmas Eve, 1776, he called his tattered, hungry army together to hear a reading of the *Crisis* prior to crossing the Delaware and defeating the well-fed, better-equipped Hessians at Trenton. General Eisenhower followed Washington's example 168 years later when he talked to his troops and gave them the score to date just prior to their undertaking the greatest amphibious assault of all history, the landings in Normandy.

In July 1776, Washington prepared a statement which was ordered read to the soldiers of his entire army. One paragraph of this statement read:

The time is now near at hand which must possibly determine whether Americans are to be free men or slaves; whether they are to have any property to call their own; whether their houses and farms are to be pillaged and destroyed, and they are consigned to a state of wretchedness from which no human efforts will probably deliver them.

A Recent Example

On 15 January 1951, General Matthew Ridgway, soon after taking command in Korea, prepared a similar statement for his troops. General Ridgway prepared his statement because he had heard from

In spite of the fact that facilities and top-level support have been provided for the information program, the success of the program will be determined by the support given by operating level commanders

young Nation must, however, be given to General Washington. His information program played an important part in building the kind of morale in his ragged army which enabled it to win against great odds.

We know that Washington often called his men together to discuss the important

several sources, chiefly from members of combat units, the questions, "Why are we here?" "What are we fighting for?" "What is the score?" General Ridgway gave his troops the score in the following message:

The real issues are whether or not the power

of Western civilization, as God has permitted it to flower in our own beloved lands, shall defy and defeat communism; whether rule of men who shoot their prisoners, enslave their citizens, and deride the dignity of man shall displace the rule of those to whom the individual and his individual rights are sacred; whether we are to survive with God's hand to guide and lead us, or perish in the dead existence of a Godless world.

If these be true, and to me they are, beyond any possibility of challenge, then this has long since ceased to be a fight for freedom for our Korean allies alone, and for their national survival. It has become, and it continues to be, a fight for our own freedom, for our own survival, in an honorable, independent, national existence.

In the final analysis, the issue now joined right here in Korea is whether communism or individual freedom shall prevail, and make no mistake, whether the next flight of fear-driven people we have just witnessed across the Han River and continue to witness in other areas, shall be checked and defeated overseas, or permitted, step by step, to close in on our own homelands, and at some future time, however distant, to engulf our own loved ones in all its misery and despair.

I would like each commander to whom this is addressed, in his own chosen ways of leadership, to convey the substance of the message to every single member of his command and at the earliest practicable moment.

General Ridgway was saying exactly the same thing to his troops that General Washington had said to his troops in 1776. I cite this example to show that men's desire to know the score has not changed since the beginning of our Nation and that successful leaders, now as then, give their troops the score.

In General Ridgway's phrase "in his own chosen ways of leadership" two things are important; first is the recognition that giving the troops the score is a matter of leadership at all echelons of command, and, second, that the *how* the message was to reach each soldier was left to subordinate commanders. It will be pointed out later that the near failure of our Army information program during the post-World War II period which resulted, in part at least, from our failure to leave the *how* of troop information to subordinate commanders.

General Andrew Jackson initiated a series of "Division Orders" just prior to the War of 1812. The purpose of these orders was, just as in Washington's day and later in General Ridgway's day, to inform his soldiers why they, as individuals, had been called upon to fight and to explain what they were fighting for. Jackson's astounding victory at New Orleans was proof of the importance of giving fighting men the basic issues of the conflict in which they were engaged.

During the Civil War great leaders on both the Union and Confederate sides used troop information to raise morale and to inspire their troops to fight for their cause.

From the foregoing, it is readily apparent that, although procedures, methods, and techniques of troop information have changed, it is today, as yesterday, a basic tool which a commander uses to give his troops the score.

A Formal Program

Although the general concepts of troop information are as old as the Army itself, it was not until World War II that troop information came into its own and a formal Army-wide troop information program was instituted. As we have pointed out before, great commanders through the ages have informed their troops regarding the cause for which they were fighting. Many of our commanders in World War II had their own troop information program long before they were ordered to establish one. They recognized the importance of that bond between a commander and his men which is created through a mutual understanding of the *why* behind their actions.

The formal program was initiated because some commanders had failed to orient their troops properly and their failure had resulted in low morale. The much publicized OHIO (Over the Hill in October) episodes of the 1940 maneuvers were excellent examples of the results of failure

to inform troops properly of the *why*. Our top commanders realized that if high morale on the part of the Army as a whole was to be attained and maintained, necessary action must be taken to ensure that Army personnel were well informed. The formal information program was inaugurated to ensure Army-wide application of the knowledge that the morale of troops who know the score is always higher than that of troops who lack proper orientation. General J. Lawton Collins, after he became Chief of Staff of the Army, stated the reason for an Army-wide information program in these words:

Discipline in the Army today cannot be founded on the ancient shibboleth of "Their's not to reason why, their's but to do and die." American soldiers particularly must know the reason why and must be convinced of the importance of their individual tasks in the operation of a unit. Hence, the importance of the individual is paramount, and respect for the rights of the individual is the keynote of American discipline and American leadership.

A Beginning

Much credit for the formal information program, however, should go to Mr. Arthur H. Sulzberger, publisher of *The New York Times*. Mr. Sulzberger, as a result of a survey made of soldier morale in the summer of 1941, recommended to President Roosevelt that an information service for military personnel be instituted at once. This recommendation was instrumental in the initiation of the troop orientation program which became the information program in 1943. From 1943 until the postwar reorganization of the Army in 1946, the information program was under the jurisdiction of the Director of Personnel of the Army Service Forces. With the postwar reorganization, Troop Information and Education was made a separate division under the Chief of Information at the Department of the Army level where it has remained.

Centralization

With the establishment of the Department of Defense and the postwar trend to-

ward centralization in Washington, much of the initiative concerning the information program was taken from local commanders. *Armed Forces Talks* prepared at Department of Defense level were required topics for discussion during three of the four troop information hours required each month. Many of these required discussion topics were dull, dry, and uninteresting to the soldier. Generally, they were written in language far above the educational level of the soldiers for whom they were intended. In their zeal to create a utopia in which each soldier would be well versed in national and international affairs, government, history, economics, and geopolitics, the planners lost sight of the basic purpose of troop information. The purpose remained that of giving the troops the score; the score of the game of which they were a part.

Elaborate materials were prepared and reams of directives were written, explaining in detail just exactly what was to be done and how it was to be accomplished, however, nothing happened at the troop level.

The Problem

The overworked company commander was inclined to throw up his hands in disgust at the volume of material and directives which he was expected to use or implement. As a result, the whole matter was usually turned over to a sergeant. Company commanders did not feel that this was *their* troop information program. They felt rather that it was a Department of Defense program.

In 1947, a lieutenant colonel completing a tour of duty in European Command headquarters, as a staff officer in the Office of the Theater Chief of Information and Education, had this to say in his final report.

In general, the program gets little command support, and the majority of the soldiers dislike or are bored with it. . . . The mandatory 1-hour-per-week requirement is a source of harassment to units concerned. I have found most regular

officers, though agreeing in theory that the program is a good idea, do not consider the program practical, and in many cases necessary. . . . I have found that in most troop information programs I have witnessed it would have been better had it not been held.

Our postwar information program was characterized in general by great plans, high ideals, much material, many directives, and highly centralized control at the higher echelons of command which were met by complete indifference and, in some cases, downright antagonism at the lower echelons.

The Need Restated

The report to the President on "Information and Education in the Armed Forces" by the President's Committee on Religion and Welfare in the Armed Forces, better known as the Weil Committee Report, dated 1 December 1949, threw the spotlight on the Army information program. The committee stated the need for an information program simply and effectively as follows:

We are convinced that an information and education program for members of the armed forces is essential to the welfare of our armed forces and to the national security. It is clear that such a program is vital to the development of civilian confidence in, and support of, the armed forces. In addition, the preponderance of testimony from our great combat leaders holds that an information and education program is essential to the development of proper battle discipline.

The report, in substance, endorsed and commended the Army's information program. It did point out specifically, however, that the main handicap was lack of command support, particularly at the operating levels.

Of the 24 recommendations made by the committee, 3 dealt with the problem of ensuring command support at operating levels for the information program.

While the Weil Committee Report caused the Army to examine and evaluate its information program critically, it was almost a year later that the Army information program received a thorough investigation by one of its own generals.

An Evaluation

In September 1950, General Collins, the Army Chief of Staff, requested Lieutenant General Clarence R. Huebner to undertake one final mission prior to his retirement from the Army; a survey of the information and education program.

General Collins, in his directive to General Huebner, stated his concept of what the information and education program should be. He said:

With respect to the information and education program, our goal should be to assure an officer and enlisted corps interested in, and reasonably well informed on, current world affairs including the ideals and aims of our country. Furthermore, I feel that we must offer the younger men in the service an opportunity to complete and broaden their education. Such programs, however, should not become an undue burden to our various commanders.

General Huebner was ideal for this assignment as he had done much to remedy the chaotic condition of information and education program in the European Command which we have pointed out earlier. In attacking this problem, General Huebner was not content to sit in Washington and examine staff studies and staff reports from the field. He went to the field. He asked commanders at the operating level the old, old question—"What's the score?" Commanders gave him the score as he visited all armies in the Zone of Interior. He also visited and held numerous conferences with officers at Headquarters, Army Field Forces; Office, Inspector General of the Army; and Office of the Army Chief of Information. The following pertinent extracts of General Huebner's findings concerning troop information and education, as contained in his report to General Collins, highlight the defects of the Army's postwar program:

Present directives issued by the Department of the Army are clear and complete. However, they are very restrictive as to subject matter and scheduling of the troop information hour. The two programs have been seriously handicapped by lack of funds, qualified personnel and failure of commanders to assume responsibility. Only recently

have adequate staffs been organized in the six armies in the United States. . . . Material issued by the Armed Forces Information and Education Division is written at a level too high for the average enlisted man, is inappropriate in many cases, lacks training aids, and has a poor format. Too much material is supplied by that division, thus leaving insufficient time for presentation of essential information by the Department of the Army and local commanders. . . . There is a failure on the part of many officers, both senior and junior, to understand the objectives of the programs and the benefits to be derived from them. There is, in many instances, animosity toward the programs, and a feeling has grown up that lumped with special services, the chaplain's hour, character guidance, career management, they are obstacles to training. Recent attacks on the program may indicate subversive elements, as in 1945, are trying to destroy our armed forces, and that some officers unwittingly assist in the objectives of those elements. . . . There is a failure on the part of commanders to recognize that the troop information hour can be used advantageously to disseminate local information on policies to the troops. . . .

General Huebner's report contained many more findings that indicated our failure to achieve greater success in our information program. However, those mentioned point out the greatest weaknesses of our postwar program. His findings were not news to a great many officers in the Army, but somehow very little had been done to correct the weaknesses. Too many officers who could have done something about it apparently thought someone else should take the necessary corrective action. Others who tried became enmeshed in the red tape and inertia so often prevalent in high echelons.

Corrective Action

Fortunately for the Army's information program, General Huebner's report, being made directly to the Chief of Staff, was not met with the resistance previously mentioned. Soon after his report was made, new Army Regulations on the subject of troop information and education were published. These regulations implemented most of the recommendations of General Huebner and provided a basis for a vitalized troop information program for

the Army. At the present time, the program is more flexible, and the responsibility for troop information rests squarely on the shoulders of commanders at all echelons. No longer is the responsibility centralized at the Department of the Army level.

The old troop information hour is now more accurately referred to as a command conference. Normally one command conference period will be held each week on duty time. Such conference periods constitute a part of military training and are included in the training schedules. Commanders now are required to use only one *Armed Forces Talk* each month as discussion material for a command conference. This leaves three periods each month for the presentation of essential Army information as well as information of local interest to commanders and troops. The materials prepared for the troop information program are now adjusted to the educational level of the troops for which they are intended. Now, adequate, appropriate, and timely materials are prepared to give the troops the information they desire.

Any animosity on the part of officers toward the program which exists today undoubtedly results from the inflexibility of the directives for the old postwar program. It is difficult to understand how any officer would object to a program which provides his men with the facts necessary for a better understanding of their responsibilities as soldiers and citizens. The greatly increased flexibility of the present program should do much to eliminate honest, sincere objections to the program.

A Comparison

Activities in troop information today would startle the professional soldier of an earlier day. But we must bear in mind that today we are dealing, for the most part, with young drafted soldiers and that the old professional soldier of the twenties and thirties has all but disappeared.

An information program is not unique

to the United States Army. The British Army has, for many years, had a highly successful information program in which discussion periods are led by officers.

The French Army is now doing an excellent job of indoctrinating its recruits with patriotism and democratic principles. As a result of this program a large number of former French Communists have become loyal citizens of France after 6 months of basic training.

The information program in the Soviet Army is also effective. Some 4 hours or more each week are devoted to Party line indoctrination. Political officers are assigned to units including the battalion. These officers serve not only as troop information and education officers, but also as welfare and counterintelligence officers.

There appears to be little doubt from our experiences in Korea that the Communist forces there have an efficient system of orienting and indoctrinating their troops. When soldiers will hold their positions and fight to the last man rather than surrender or retreat, there can be little doubt of the effectiveness of their indoctrination methods.

Many Latin American armies have also adopted information programs using much of our material as the framework for their own programs.

A Permanent Feature

Troop information is here to stay. It has proved its value. We have pointed out the indorsement of the program by the Weil Committee and, later, by General Huebner's report. General Collins has reiterated many times his belief that the program is essential. In a recent personal letter to his army commanders, he stated:

I am particularly concerned that individual commanders, from the highest levels to the squad leaders, are thoroughly aware of the necessity of explaining to their men the reasons for actions taken. The philosophy of "tell them why" is even more valid today than in times past. We can succeed in having a top-notch information and education program

only if every commander recognizes it as a function of command and shows continuing interest in it.

Last year, Senator Lyndon Johnson, Chairman of the Senate Preparedness Subcommittee of the Armed Services, rendered a report on the results of his committee's investigation of the troop information program in the Army. This report clearly indicated that while some commanders were still dragging their feet, the new, vitalized program in the Army is, in general, effectively giving the troops the score. The following are extracts from his report:

Good troop information programs contribute to good morale. The American soldier, if indoctrinated with the "why" of his service, accepts his military responsibility with interest, courage, and devotion.

Morale is generally good. Good troop information programs have generally been effective in maintaining good morale; however, information programs could be improved at some installations.

General of the Army Omar Bradley had this to say:

For in this acid test between conflicting ideologies it is going to take a better citizen, and a stronger American, to meet the constant and continuing attacks on democratic ideals and institutions . . . During the war it was apparent that men fought best when they understood why they were fighting.

Former Secretary of the Army Gordon Gray summed up the need for an information program in the following statement:

It is axiomatic by now that the American soldier, if you want to get the best results from him, must know why a thing needs to be done. Then he will do it better, faster, and more willingly than any soldier in the world. Baron von Steuben learned this when he came to this country to help our Revolutionary forces, and he described this unique quality in a letter home in which he wrote: "In the first place, the genius of this nation is not in the least to be compared with that of the Prussians, Austrians, or French. You say to your soldier, 'Do this' and he doeth it; but I am obliged to say, 'This is the reason why you ought to do this,' and then he does it. We try to tell our soldiers 'why' as well as what, when, where and how."

General Mark Clark expressed his feeling concerning the importance of an information program in this way:

I cannot emphasize too strongly the importance of keeping our soldiers fully informed concerning the necessity for their services in the Army, why they fight, and why they must be sent to overseas garrisons to perform essential occupation duties. A

sound troop information program will, of course, answer these inevitable questions before they are asked by the individual soldier. In addition, the program must instill in our soldiers a full appreciation of the blessings they enjoy by living under our democratic system, and of their responsibilities of citizenship to preserve these blessings for this and future generations. . . . I am most anxious that you give the troop information and education programs your most careful attention to ensure that commanders at all echelons present these programs to their men with the maximum effectiveness.

We of the military must never lose sight of the fact that individual members of the Army have a great influence on public opinion concerning the Army. If our soldiers believe in the Army, the public will.

Summary

The public is comprised of mothers, fathers, and relatives of Army personnel, and the welfare of these soldiers is an important factor in determining the degree of support the Army will receive from their families. Clergymen, educators, and others who have a great deal to do with molding public opinion will give their support to the Army only if there are moral, ethical, and educational safeguards in the training programs. The Army "graduates" many thousands of men into civilian life each year. The attitudes of these ex-servicemen thus become a nucleus

of enlightened opinion, around which favorable attitudes toward the Army may be expected to develop. Their influence upon public opinion, both while they are in the Army and after they return to civilian life, can form the basis of a mutual respect between the Army and the public it serves.

If the Army can return the drafted citizen-soldier of today to his civilian community tomorrow, not merely as a trained soldier, but as a self-respecting, mature citizen with a sincere appreciation of his obligations to preserve a democratic America, the Army most certainly will be supported by that civilian community and universal military training or any other legislation necessary for the Army to accomplish its mission as a member of the unified armed forces team will be forthcoming without having the Army placed in a position of literally begging for the means with which to do its job.

We have the organization, material, and the solid support of higher commanders necessary for a successful information program, however, the success or failure of our troop information program will be determined by the amount of command support which commanders at operating levels give the program.

Through our troop information and education programs, we have made our soldiers the best informed in the world. We feel that this is necessary since as citizens of our democracy, often in remote parts of the world, they must have access to information to continue intelligently to discharge their responsibilities as citizens.

General J. Lawton Collins

Future of Yugoslavia Under Tito

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The views expressed in this article are the author's and are not necessarily those of the Department of the Army or the Command and General Staff College.—The Editor.

THE first crack in the Iron Curtain was revealed by the open break between Tito and the Soviet Union. *Pravda*, an official Soviet news organ, stated that Tito had joined the Imperialist camp. The Soviets played upon the theme that Tito had become a tool in the hands of the United States and England, who were struggling against the mighty democratic group and its guiding forces—the Soviet Union. The Soviet Government officially designated this camp as “the enemy of the Soviet Union.”

When Mr. Edvard Kardelj, Yugoslavia's Minister for Foreign Affairs, was asked if Yugoslavia's break with the Soviet Union was not a little like David fighting Goliath, he replied, “In history the Davids have always won.”

The Chetnik Way

Immediately after the German attack on Yugoslavia in April 1941, a resistance movement started. This resistance movement was led by Draza Mihajlovic, a staff colonel in the Yugoslav Army, who refused to obey General Kalafatovich's order to surrender. He (Mihajlovic) told his commanding general, “You may lay down your arms and surrender, but I am going to continue the struggle in the Chetnik way, to-

gether with those who wish to follow me.” Thus, the Chetnik movement was started.

Mihajlovic represented the Royal Government inside Yugoslavia and wanted to maintain the authority and strength of that government. He was violently opposed to communism.

Tito's Rise to Power

In 1941, following the German attack on Russia, an active Communist Party member, Josip Broz, better known as Tito, made his way into Serbia and there began to organize a partisan army to fight the Germans who had invaded Yugoslavia. Tito established himself as head of this partisan force, with Communist members forming the nucleus of the force.

Josip Broz adopted the Party name of Tito, and, by his own admission, the nickname goes back to 1924 when he was doing illegal work in Yugoslavia after the Communist Party had been outlawed there. Tito was born on 25 May 1892, the son of a blacksmith, and was christened in the Catholic Church. In 1915, Tito was drafted into the Austro-Hungarian Army and sent to the Russian front, where he deserted or was captured. The Czarist Government sent him to Siberia as a prisoner of war. Following the October Revolution, he fought in the Red Army during the Civil War.

Tito returned to Yugoslavia with a Russian wife in 1924, as a labor organizer. He continued these activities until he was arrested in 1929, and was sentenced to 5 years in jail.

In late 1941, the Chetniks (Mihajlovic) and the Partisans (Tito) began to quarrel. Attempts at reconciliation failed, and by 1942 their differences broke into an open fight. The Germans regarded Tito as a Russian agent and Mihajlovic as an agent of the allies. In fact, in July 1943, the German authorities simultaneously announced a reward of 100,000 gold marks each for the heads of Tito and Mihajlovic.

Since Tito was a trained Party member, the Soviet Union was to endorse him at the first opportunity as the true representative of the Yugoslav people. This occasion was not long in coming for, in July 1943, the Soviet Government charged that Mihajlovic was collaborating with the Germans and fighting the Partisans. The Communist Parties all over the world immediately launched a press program against Mihajlovic and the Chetnik movement claiming to the world that the Chetniks were monarchists, and were, therefore, reactionaries; the Partisans were antimonarchists, and were, therefore, progressives.

Originally, Mihajlovic had at least the moral support of the United States and Britain. The United States furnished the Chetniks, among other supplies, four *Liberator* bombers early in 1943, and, on 7 May 1943, the British Government informed Mihajlovic that they hoped soon to be able to furnish material on a greater scale than in the past. However, on 8

ginning of the end so far as support for the Chetniks was concerned. Early in 1944, Mr. Churchill and President Roosevelt agreed to support the Partisans.

Soviet Endorsement

In March 1944, a Soviet military mission was sent to Tito which greatly strengthened his hand, and, on 28 September 1944, the Soviet Army reached the Yugoslav border. They asked Tito for permission to enter Yugoslavia, promising to leave civilian administration entirely in Partisan hands. Tito, to no ones surprise, granted their request. The purpose of the mission's strategy was political rather than military and their goal was the capture of Belgrade and the establishment of Tito in power as chief of state by the Soviet Army.

Tito entered Belgrade in the wake of Russian tanks, and Mr. Churchill, the British Prime Minister, stated in the House of Commons that "Tito's government has now installed itself in Belgrade with Russian assistance." Russia and Yugoslavia signed a mutual assistance agreement soon thereafter.

Russo-Yugoslav Postwar Relations

Mihajlovic was captured by Tito's forces in March 1946, and was tried by a Communist court and executed on 16 July 1946. Thus, Tito eliminated his chief rival and one who was beloved by many Yugoslavs.

Marshal Tito and the Yugoslav people have demonstrated that they will actively resist any aggressive political and military move of the Soviet Union and her satellites directed against their homeland

December 1943, the Right Honorable Richard Kidston Law, then the British Minister of State, informed the House of Commons that henceforth Tito was to be favored "for the simple reason that the Partisans' resistance to the Germans is very much greater." This was the be-

World War II gave the Soviets the opportunity to attain their long-awaited control of Yugoslavia. Tito and the Communist Party had been prepared long beforehand as an instrument for that control. Once Tito was installed in Belgrade, he openly adopted a hostile attitude to-

ward America and Britain. Two days after VE-day, Tito asked the military missions of the two countries to leave Yugoslavia. The deliberate shooting down of unarmed American airmen while flying over Yu-



A group of soldiers of the Yugoslav Army returning from drill singing as they march.

goslavia, in August 1946, was also a part of a determined policy to strengthen the tie between Tito and Stalin.

After Tito's installation at Belgrade, the Tito-Stalin horizon seemed cloudless. The Soviets flattered the boundless ambition of the Yugoslav dictator and encouraged his well-known desire for luxury.

Tito forced communism on Yugoslavia. The methods used later in the communization of satellite countries were first tested in Yugoslavia. Suppression of political parties, curtailment of freedom of the press, elections from a single hand-picked list of candidates, and the merciless liquidation of the middle classes were methods first practiced in Yugoslavia before being applied in other satellite countries.

Tito's prospects were bright: with a recent trade agreement and friendship pact with the USSR; and a government and parliament which appeared legitimate in the new Communist world. Yugoslavia was an independent member of the Communist family of nations. Tito was head of a powerful Yugoslav Army and was accepted as *secundus inter pares*. In the United Nations and on the diplomatic front, the Soviets supported Tito's claim for Trieste even though they had demanded Yugoslav evacuation of that territory in 1945 as the use of force in this instance would have disrupted their programs for Eastern Europe as a whole. After the claim for Trieste was denied and Trieste was declared a free territory, Tito placed an iron curtain around that portion of the free territory bordering on Yugoslavia and under its administration.

The Blast Heard Around the World

On 28 June 1948, the Soviets' victriolic condemnation of Tito and the Communist Party of Yugoslavia revealed the first important breach in the USSR's leadership in Central Europe. The open break between the Kremlin and her principal satellite emphasized the importance of Yugoslavia in European affairs.

The conflict between Yugoslavia and the Soviet Union was to provoke much comment in editorials and over the radio, as well as in high government offices throughout the world. Overnight, "experts" expounded their theories as to why the break had occurred and forecast its impact upon the world. There were many who doubted seriously that Tito had many more days to live.

The Cause

What was the cause of this break in the relations of these two Communist countries? This question is difficult to answer because of the many people involved, the petty jealousies among leaders in the Communist Party who were attempting to gain favor with Stalin, and because of

the restrictions imposed by the Iron Curtain that inclosed the communistic states from the rest of the world. It may be of interest, however, to examine some of the theories, or possible causes, of the split. One popular theory was that success had gone to Tito's head, and that he had begun to see himself as the rival or potential successor to Stalin as the leader of the Communist cause. One must remember that Tito had come a long way in a short time—from a very obscure person in 1940 to the absolute dictator of Yugoslavia by 1945.

Another theory was that Tito had been entrusted with certain tasks by Moscow and had not been willing to undertake them. A third theory suggested that Tito had visualized ambitious plans for a Balkan federation, with Yugoslavia as the controlling state. There were those who considered it such a fantastic situation that they thought it had been created intentionally.

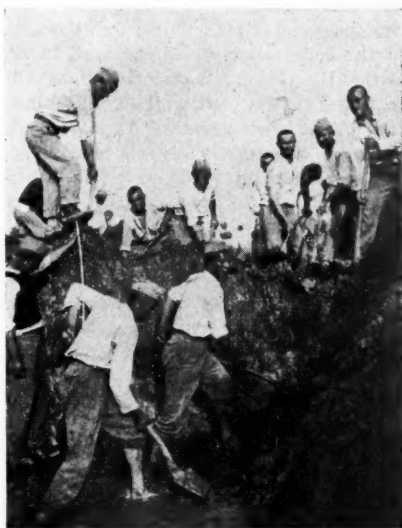
Although the Tito-Stalin split broke suddenly upon the world, it had been developing for some time. Tito was determined to run his own show despite Stalin's plan to make Yugoslavia another pillar of the Soviet empire. Unlike other rulers which Moscow had placed over other satellite states, Tito and his associates were not mere puppets; they had successfully fought the Axis armies and their political enemies inside Yugoslavia.

The Problem

Tito was determined to bring industrialization and its many blessings to Yugoslavia. He had promised the Yugoslav people after the war that, under his program of industrialization, nationalization, and collectivization, factories and hydro-electric plants would be developed, irrigation systems would be constructed to bring water to arid regions, oil resources would be tapped, and modern highways would be built throughout the country.

Tito had hoped to obtain financial as-

sistance and heavy equipment from the Soviet Union to accomplish these things. Tito was coming to realize that Yugoslavia's place in the over-all Soviet economic plan was to remain what she had always been—poor, backward, and weak. Raw materials which would have supplied native industry would be shipped instead to the Soviet Union or to other satellite



Yugoslav Army personnel being used as laborers on a Federal construction project.

states. The Soviet Union set prices on Tito's exports, according to a ratio that would cost the Yugoslavs \$28,000 for every Soviet tractor. By this Soviet arrangement, Yugoslavia's labor and natural resources were to be exploited for the benefit of the Soviet Union. Tito, of course, would have none of this.

The Kremlin was not satisfied with the progress Tito was making in the collective ownership of the land and it complained bitterly that the land was still in private ownership, that it was bought and sold, that considerable portions of land were

concentrated in the hands of rich peasants, and that hired labor was used. The peasants still hold a key position in the Yugoslav system; they still constitute almost 70 percent of the entire population of the country, and more than 90 percent of the land they hold is still privately owned. Tito realized that critical decisions concerning the successive steps and tempo of the class struggle in Yugoslavia might soon pass out of his hands if methods used in the collectivization of the land in the Soviet Union were transferred integrally to the Yugoslav scene. He also realized that pitched battles between the peasants and the government agents and police were certain if this policy were established.

Tito, confronted with realities, soon realized that he could not overcome the opposition of the peasants, especially of the Serbs. As Mr. Sumner Wells said, "In his dual role as head of the Yugoslav Communist Party and as Moscow's proconsul, Tito found himself up against one of the toughest specimens of the human race—the Serbs."

The Soviets had made an offer to Tito to rearm and reorganize the Yugoslav Army. Tito did not relish the idea since he felt that under the plan the Army would lose its national character and become, in effect, an auxiliary of the Red Army. He was unwilling to permit Soviet intelligence agencies to operate in the Yugoslav Army. In the Soviet plan, Yugoslavia was to train conscripts in yearly batches but not maintain any considerable standing army and neither was she to build a national armament industry. Tito felt the Soviets wished to obliterate their characteristic nationalism and self-reliance.

Tito was beginning to grow restless, and rumors of his discontent reached Moscow. Further, the Kremlin heard that unkind things were said in Belgrade about the demands of the Soviet trade delegates, the salaries and behavior of the Red Army officers, and the way the Soviet intelli-

gence was recruiting Yugoslav citizens.

Stalin, at this point, seemed to realize that the time was ripe to bring Tito, the "realist," into line with the thinking of the Cominform. The final goal was complete "Sovietization." The collectivization of the land was to be complete, since the most dangerous seeds of capitalism still lived on in the peasantry.

Tito tried to convince Moscow that a certain autonomy of action must be permitted if he were to bring communism into a non-Soviet country; however, to the Soviet leaders, Tito's attitude of temporization seemed careless, and they insisted upon complete communization without compromise. Tito having failed to meet the Soviets' expectations, the Cominform was set in motion to demote the man who had lost the confidence of the Kremlin and to replace him with someone who would carry out the policies it dictated.

The Split

On 18 March 1948, formal notification reached Belgrade that the Soviet Government had decided to withdraw all military advisers on the ground that they were "surrounded by hostility"; the next day Tito was informed by the Soviets that all civilian missions would be withdrawn because of "lack of hospitality and lack of confidence" shown them.

Tito and Yugoslavia's fate had been decided. After several exchanges of communiques between Belgrade and Moscow, the Information Bureau (Soviet-Communist controlled) made the following statement on 28 June 1948: "The Central Committee of the Communist Party of Yugoslavia has placed itself and the Yugoslavia Party outside the family of the fraternal Communist Parties, outside the United Communist front and consequently outside the ranks of the Information Bureau."

Thus came the open break between Tito and Stalin on 28 June 1948.

The Kremlin unsuccessfully attempted

to incite the Yugoslav Communist Party against Tito for the obvious purpose of replacing him with a Moscow-controlled puppet. Tito reacted vigorously and jailed two leading members of his party and cracked down on everybody suspected of plotting against his regime.

Economic Situation

Yugoslavia began her 5-year plan early in 1947. The plan envisioned the transformation of Yugoslavia from a backward, war-destroyed Balkan country into a highly developed, modern country with an economy balanced between agriculture and newly developed modernized industries. The plan, however, was dependent upon a network of bilateral trade treaties with the Soviet Union and other satellite states and, to a lesser extent, on some Western countries. Yugoslavia could not succeed in her ambitious plans if she were to become a single unit isolated from the West and ostracized by the East (the Soviet Union and her satellites).

When the Soviet leaders realized that their hegemony had met with resistance on the part of Yugoslavia's people, the USSR and her satellites applied economic blockade tactics against Yugoslavia. Hungary cancelled treaties. Czechoslovakia withheld deliveries of goods already completed and for which Yugoslavia had already paid in materials and credits. Rumania carried the blockade so far as to refuse payment of a debt of honor resulting from a loan of Yugoslav wheat during the Rumanian famine. Bulgaria refused to carry out her treaty obligations to Yugoslavia.

The economic blockade imposed by the Soviet Union caused Yugoslavia to lose overnight more than 45 percent of her markets. The Soviet Union's aim was to ruin Yugoslavia's 5-year plan and thus cause a great upheaval among the people of Yugoslavia against Tito, and his party.

Yugoslavia's economic problems today stem from three sources:

1. A grandiose industrialization pro-

gram that is bogging down for lack of capital and materials.

2. The economic dislocation inherent in the reorientation of Yugoslavia's trade toward the West.

3. The results of a disastrous drought during 1950.

In considering the seriousness of the



Marshal Josip Broz Tito is the Christian-born son of a Yugoslav blacksmith.

economic problems, one must bear in mind that Yugoslavia is dependent upon imports for about 75 percent of the raw materials for her manufactured goods.

Tito Faces West

Let us consider the steps Yugoslavia has taken to overcome some of her economic problems. Tito realized his dilemma, caused by the break with Stalin, and he further recognized the necessity for finding trade elsewhere after the Soviet Union and her satellites applied the economic blockade against his country. Tito, being the realist that he is, began to put out feelers to the West for assistance. His

main political preoccupation, of course, was that regardless of whatever credits or loans he might get from the West the independence and integrity of his country should not be jeopardized. He had already risked everything to preserve these against Soviet encroachment.

The policy of the Western powers was to help Tito without making heavy demands in return.

Early in 1949, the National Security Council broadened American commercial policy so as to permit American concerns to sell Yugoslavia materials required in order to maintain a "peacetime economy."

In the closing days of 1949, Great Britain signed a trade agreement providing Yugoslavia with a credit of 8 million pounds sterling (repayable in 5 years) to facilitate purchases in Great Britain. The British also granted commercial credit of 5 million pounds sterling to the Yugoslavs. Tito negotiated additional loans from the Export-Import Bank. The total amount of loans and credit made available to Tito by the Western democracies by mid-1950 was 89 million dollars with no strings attached to the loans or trade agreements that could be considered as interfering with the independence of the Yugoslav Government.

As a result of the severe drought in the summer of 1950, Yugoslavia was threatened with famine. The food shortage, together with the shortage of consumer goods, added to Tito's problem and provided fertile ground for the subversive activities of the Kremlin and seriously reduced the capacity of the Yugoslav people to resist aggression, either internally or externally.

On 20 October 1950, the Yugoslav Government formally requested United States assistance in averting the worst effects of the disastrous crop failure. This request came only after the Yugoslav Government had exhausted all means of meeting the situation through its own efforts.

After having received assurances from

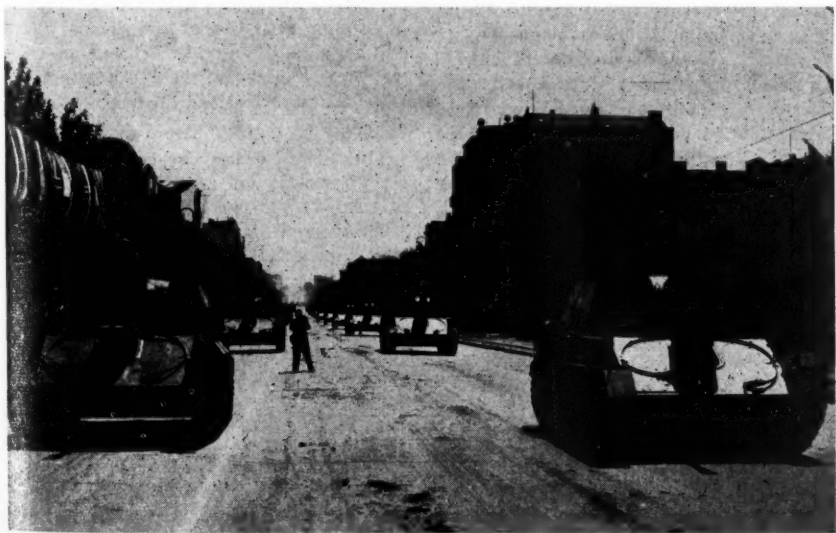
the Yugoslav Government that all assistance furnished by the United States would be given full and continuous publicity, that the aid would be distributed equitably and fairly among the Yugoslav people, and that the distribution would be under the observation of persons designated by the United States, the United States Government, in December 1950, made available to Yugoslavia nearly 28 million dollars in stop-gap aid from the Economic Co-operation Administration stock pile in Europe. Then, later the same month, the United States Congress voted an additional 38 million dollars for Yugoslavia in emergency food shipments. The Yugoslav Government informed the United States and British Governments in the spring of 1951 that because of the drought Yugoslavia was unable to exchange foodstuffs for raw materials on the world market, that her stocks of essential industrial raw materials were almost depleted, and that many of her factories might have to be closed in the near future, which would cause widespread unemployment and would further lower Yugoslavia's living standard. At the present time, the Yugoslav Government's principal shortages include cotton, wool, gasoline, and lubricating oils. The continuing shortages of raw materials for light industries are acute, and it is in these industries that shutdowns may cause serious unemployment.

The possibility of national economic stagnation in Yugoslavia is as potentially dangerous today as is external military aggression. The Yugoslav economy must be reprimed with outside aid or it will gradually come apart at the seams.

Washington and the Western powers have let it be known that they are willing to continue aid to Yugoslavia, and Tito is sure that he can keep his country on an even keel as long as there is aid to ease the food problem and assistance in securing raw materials.



Tito has almost a half million physically fit, highly trained men under arms; an army rated by many as one of the finest in Europe today. Above, a Yugoslav Army unit mounted in American-made vehicles. Below, a Yugoslav tank unit parading through the streets of Belgrade in Soviet-built tanks mounting guns which were made in the USSR.



Political and Military Pressure

Since the break between Stalin and Tito, the Soviet pressure against Yugoslavia, like the development of Soviet foreign policy as a whole, has evolved through various stages. In the first period, Soviet propaganda against Yugoslavia utilized the medium of radio to call openly on Yugoslav citizens to resist and overthrow the legal government of Yugoslavia, while the Cominform apparatus tried to inveigle Yugoslav citizens into working against their own country. This, without question, was gross interference in the internal affairs of a sovereign state.

The rules of diplomatic immunity were violated. Diplomatic mail bags were opened and the personal freedom of diplomatic personnel was violated; Yugoslav diplomatic representation was severely harassed by all Soviet bloc countries. An intelligence network of foreigners was organized within Yugoslavia, and the Soviet Union and her satellite states saw to it that subversive leaflets were distributed throughout the country. The Cominform, through broadcasts from satellite states, encouraged its followers in Yugoslavia to engage in sabotage activities. "Incidents are being organized and provoked," accuses Foreign Minister Kardelj of Yugoslavia, "almost every day along our frontiers." In 2 years, he charged, 896 frontier incidents have been staged by the Kremlin against Yugoslavia. Yugoslav citizens have been murdered in their homeland by Cominform agents.

Soviet Propaganda

At every opportunity, the Soviet Union and her satellite states would tell the world, and especially the people of Yugoslavia, that Tito had sold out to the West and that he was a mere pawn in the hands of the "Imperialists." On 9 April 1949, Tito announced to the Third Peoples' Front Congress that "no intimidation from the West or East can divert us from our

principles as determined followers of Marxist-Leninism or from our own road to socialism." And he added defiantly that Yugoslavia would trade with the West on a *quid pro quo* basis, Yugoslav goods for Western machines and money. Anything else would be "a crime against our Socialist country."

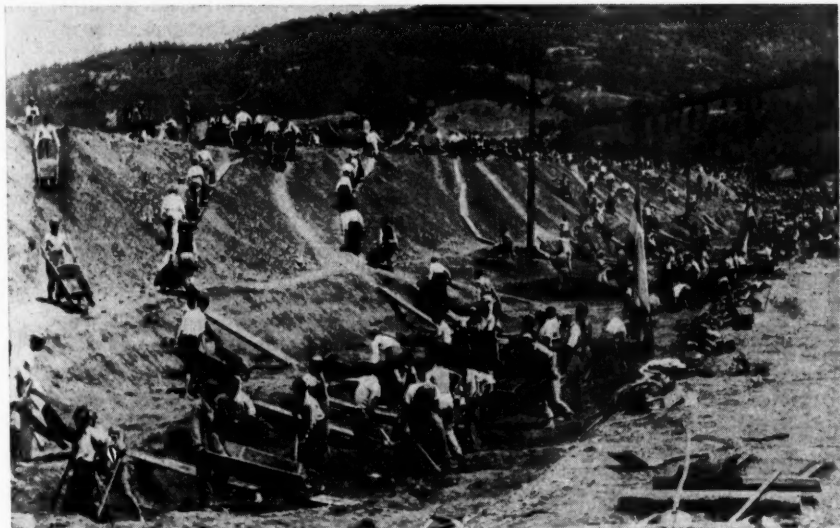
Another line that the Soviets have taken against Yugoslavia is that they are doing a thorough job of war-of-nerve propaganda. The Cominform radio constantly charges Tito with the persecution of her bordering states' minority groups within Yugoslavia. Frontier incidents of all kinds are provoked constantly. Cominform propaganda accuses Yugoslavia of preparing to attack her Cominform neighbors, and of mounting espionage and sabotage operations for the Americans.

The 'White Paper'

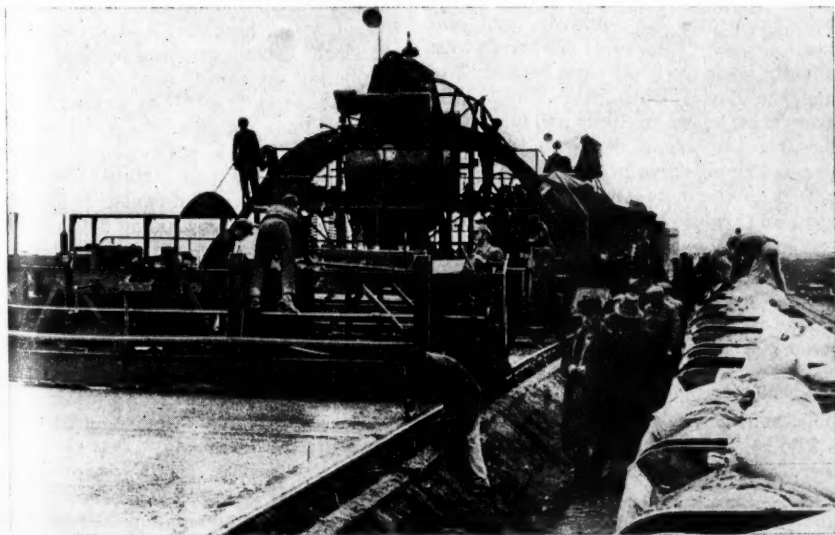
On 9 March 1951, Tito's government officially protested against the movement of Soviet arms and troops around Yugoslavia's borders. The protest came in the form of a 481-page "white paper" on the aggressive activities of the Soviet Union and her satellites against Yugoslavia. Copies were delivered to the Western nations and to United Nations Secretary General Trygve Lie.

The "white paper" accused the Soviet Union of applying forceful means in an attempt to overthrow Tito's independent Communist regime. It further charged that Rumania, Hungary, and Bulgaria are carrying on a "permanent little war" along Yugoslavia's borders; they are erecting barbed-wire fences, planting mine fields, digging trenches, constructing machine-gun nests and emplacements for mortars and artillery, and building observation posts along the frontier.

Tito further accuses the bordering satellite states of getting bombers and tanks from Moscow in direct violation of peace treaties; shifting civilian populations



Yugoslavia's 5-year plan envisaged the transformation of a backward, war-torn country into a highly developed, industrial nation with an economic balance between agriculture and newly developed industries. Above, workers using primitive methods of road construction. Below, Western machinery importations speed up Yugoslav road construction.



from border regions and sheltering Soviet troops.

Thus, one can readily see that the USSR and her satellite states have used every possible course of action short of open warfare against Tito and his party. The aim of the Soviet Union has been clear since the open break with Yugoslavia occurred—to dispose of Tito and his party and to replace him with a Soviet-sponsored “puppet.”

Will Tito Return to the Soviet Orbit?

In the foregoing discussion we have shown that Tito is an individualist and a realist. Further, it has been pointed out that Tito came to power by his cunning ability; that he has taken advantage of war supplies furnished him by the United States and Britain, and by the Soviets. Then, when he felt he could benefit more by aligning himself with the Soviet Union, he lost no time in doing so.

After a few years of Soviet sponsorship, Tito realized that Yugoslavia was playing second fiddle to the Soviet Union. Stalin attempted to tell Tito how to run his country—politically, militarily, and economically—but Tito would not permit this. Finally, when the break came between Tito and the Soviet Union, the USSR used every trick known to Stalin and his henchmen, short of war, to destroy Tito and his party. The objective of the Soviet Union now is to eliminate Tito and his government and replace them with a regime subservient to Moscow.

Recently, when Tito was asked whether, looking back, he would act differently if he had it all to do again, he paused as if recounting in his mind the steps by which he had earned Stalin's hostility. “No,” he said deliberately, “no compromise was possible, and none is now.”

Tito has burned his bridges behind him; there can be no turning back. The only way he could return to the Soviet family would be in chains. Stalin's method of do-

ing business does not include giving a dissenter a second chance.

Tito and the West

Since it is highly improbable that Tito could or would return to the Soviet orbit, what is next for Tito? As has been pointed out, for Tito to remain solvent at home he must carry on trade with the outside world. Stalin has made trading with the Soviet Union and her satellite states impossible. Therefore, Tito must seek aid from the United States and the West, for without outside aid Yugoslavia might decay from within and Tito might be forced out by Soviet pressure through her agents inside Yugoslavia. Under present circumstances, Yugoslavia can remain independent only under Tito, and since Tito can retain his position as chief of state only by the maintenance of Yugoslavia's economic health, the future of Yugoslavia as an independent state depends upon Tito's obtaining that aid.

Yugoslavia's Future

Yugoslavia's future, then, depends upon our answer to the question “Should the United States and the West continue to aid Tito?” From a practical point of view, considering the world situation today, the only answer is “Yes!” The argument for aiding Tito is not based on our love for communism. Tito is a Communist. He is the dictator of a police state. However, Tito knows the source of danger to himself and his party, and, by aiding Tito, Yugoslavia will at least remain an independent state.

Of what advantage is it to the Western democracies to have Tito and Yugoslavia remain an independent state outside the Iron Curtain? Some of the advantages are:

1. It is a crack in the Iron Curtain and shows the world that Stalin and his followers are not invincible.

2. If the Soviets regain control over Yugoslavia, it is expected that they will not stop with the elimination of Tito. The

Soviet bloc would be in a position to take over Trieste and pose an immediate threat to Italy and Greece.

3. Tito has under arms today almost a half million soldiers. These men are physically fit, highly trained fighters whose morale is good. Some observers rate Tito's army one of the best in Europe—with the exception of the Soviet Army. Recently, in a speech in Belgrade, Tito warned the Soviet Union and her satellites of the consequences should they attack Yugoslavia. Tito said, "Every inch of our land has been soaked in blood in the past, and, if necessary, it will be soaked in blood again, but it will remain ours." He further stated, "We are always ready to defend ourselves from anyone who wishes to deprive us of our freedom and independence."

4. If a conflict is forced upon the West by the Soviet bloc, Yugoslavia would constitute a military factor which the Soviet Union could not overlook, and Tito's army could provide flank protection for a counterblow launched from another area.

We have listed some of the advantages that the Western democracies would enjoy if Tito and Yugoslavia remain outside the Soviet orbit. What are the advantages for Tito in his leaning toward the West?

1. Economic aid from the West, without which Tito would not be able to survive. This aid has been furnished Tito and his government without any interference from the donor as to how Tito conducts his internal policies.

2. Military aid from the West, as well as the implied promise of United Nations help for Tito if his country is invaded by the Soviets or her satellites. The statement by President Truman, in which he said,

"An attack against Yugoslavia might well strain to the breaking point the fabric of world peace," gives the implication that the United States would support any United Nations action to assist Yugoslavia in maintaining her independence. Military assistance for Tito was further implied when Aneurin Bevan, then British Minister of Labor, told the House of Commons, on 15 February 1951, that "any threat to Yugoslavia is naturally of concern to His Majesty's Government."

Conclusions

Four conclusions may be drawn from this discussion:

1. Tito is a realist and will take advantage of any situation to improve his position within his country. He is a dictator and will remain so, allowing no outside influence in the conduct of his state's internal affairs.

2. Under present circumstances, it is in the interest of the West to keep Yugoslavia an independent state and out of the Soviet orbit, and the United States and Western democracies will probably continue assistance to Tito and his regime.

3. Barring some drastic changes in the situation, Tito will be able to maintain his position as supreme ruler of his country. Further, Tito and his people will continue to resist any aggressive move, either political or military, by the Soviet Union or her satellites against their homeland.

4. If the Soviet Union should decide to go to war with the West, though not necessarily closely allied with the West, Tito, with his large army, would stand like a dagger pointing directly at the heart of the Soviet homeland and her satellites.

THREE YEARS OF NATO

WITH the admission of Greece and Turkey, the North Atlantic Treaty Organization (NATO) is now represented by 14 freedom loving nations of Europe and North America. In 3 years, most of these countries have developed military potentials which were believed impossible prior to the creation of NATO. Joint training exercises, many of which have taken place in the Western zone of Germany, have not only brought most of these countries closer together, but have also done much to improve their combat effectiveness. The United States has provided weapons and various types of technical military equipment under the Mutual Defense Assistance Program.

Progress Has Been Made

Since the inception of the North Atlantic Treaty Organization on 4 April 1949, the member nations have provided their best trained officers and men, and are taking steps to standardize their weapons and equipment wherever possible. As a result, the organization is working toward an estimated strength of 50 divisions, a force of approximately 4,000 aircraft, and substantial naval power for the present year. In addition to building up NATO's land, sea, and air strength, most of the member nations will participate in some 45 training exercises and maneuvers, several of which have already been completed. This is in marked contrast to 1951, when only 10 such exercises took place.

In addition to the European program, service personnel from abroad are receiving specialized training at various armed forces installations in the United States. These men in turn apply this training to their own military programs.

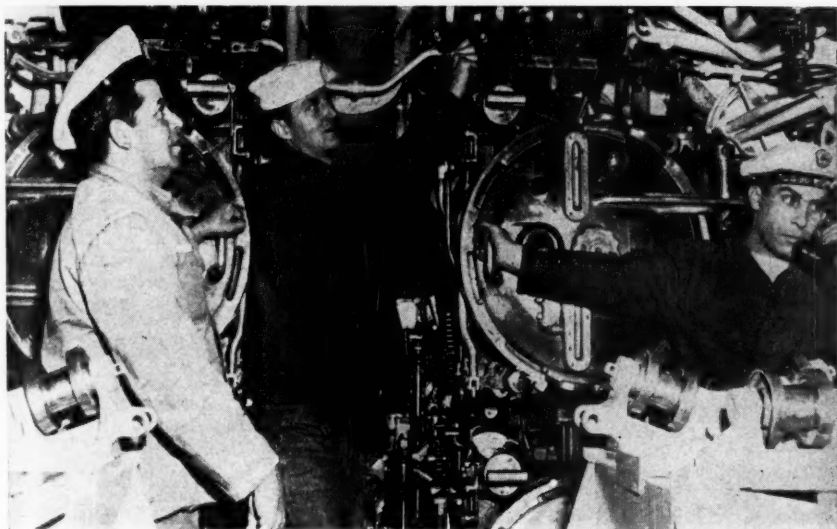
Majority Are European Nations

Aside from the United States, Canada, and Iceland, NATO nations are concentrated on the European Continent proper and the Scandinavian Peninsula. Because of its proximity to the United States, the military alliance between this country and Canada was strong even before the creation of NATO. The United States provides forces to safeguard the security of Iceland.

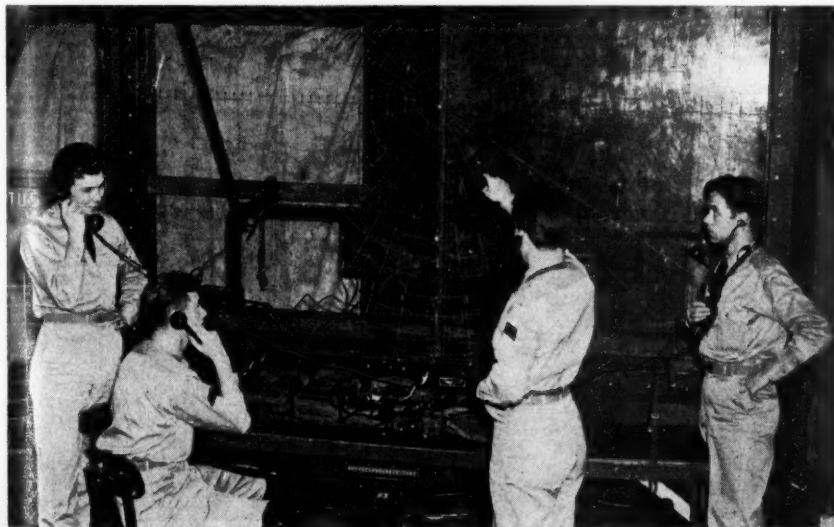
A Powerful Military Barrier

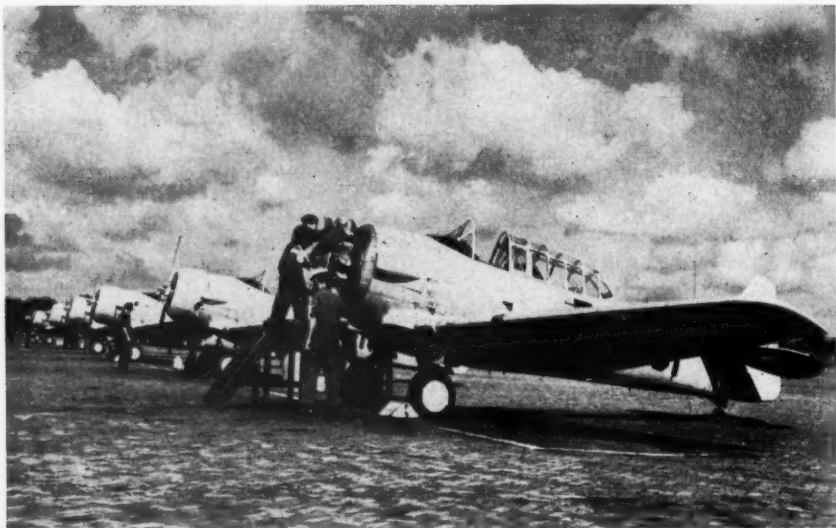
Recently, the Defense Department sent additional forces to Europe to implement those of other nations taking part in the mutual defense effort. This is in addition to the occupation forces in Germany, Austria, and Trieste. From a network of military units with little training and little or no equipment, NATO has molded the armed forces of most of the North Atlantic Treaty countries into a powerful military barrier against the threat of potential aggressors. In the face of the tremendous military build-up in Eastern Europe, these nations are taking every precaution to insure their peace and security through a highly intensified program of military preparedness and unity.

In the face of a tremendous military build-up in Eastern Europe, the North Atlantic Treaty nations are taking every precaution to insure their security through an intensified program of military preparedness



Service personnel from abroad are receiving specialized training at various United States armed forces installations which they in turn apply to their own military programs. Above, two Turkish sailors study torpedo operation aboard the USS *Blower*. Below, Norwegian airmen study radar operation in Mississippi.—Department of Defense photos.





The United States has provided weapons and technical military equipment under the Mutual Defense Assistance Program. Above, crewmen of the Royal Netherlands Air Force study the American T-6 trainers shipped to the Netherlands. Below, tanks awaiting shipment to the NATO countries of Europe.—Department of Defense photos.





The Department of Defense recently sent additional troops to Europe to bolster NATO forces taking part in the mutual defense effort. Above, the American 116th Fighter-Interceptor Squadron being welcomed to Europe. Below, General of the Army Dwight D. Eisenhower inspecting a newly arrived armored unit.—Department of Defense photos.





North Atlantic Treaty nations are taking steps to standardize their weapons and equipment wherever possible. Above, members of a French armored unit training with American-made *Sherman* tanks. Below, Greek Army personnel studying the nomenclature and identification of an American-made *M24* light tank.—Department of Defense photos.



MILITARY NOTES

AROUND THE WORLD

UNITED STATES

Army Aircraft

Seven branches of the Army now have aircraft as part of their basic equipment. They are Infantry, Armor, Artillery, Ordnance Corps, Transportation Corps, Signal Corps, and Corps of Engineers. An additional technical service, the Medical Corps, soon will have aviation as part of its organic structure.—News release.

Weather Data

Equipment recently developed by the Army Signal Corps and described as a "rawin" (radio wind) system will help gather more accurate facts about wind direction and wind speed.

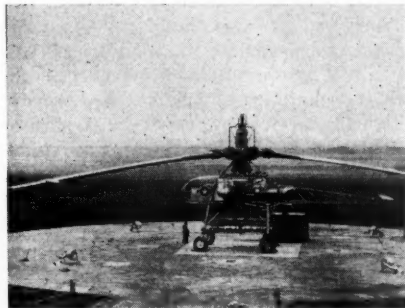
The "rawin" system consists of a mobile automatic tracking radio direction finder and a new type of radiosonde, or radio set, carried aloft into the atmosphere by weather balloons.

The "rawin" set permits, for the first time, continuous automatic tracking of balloon flights and recording of atmospheric conditions aloft. It can be operated remotely, if necessary. The set it replaces had to be manually operated on the spot. The radiosonde transmits weather data back to earth automatically, including information on wind speeds, wind directions, pressure, temperature, and humidity.—News release.

XH-17 Helicopter

The world's largest helicopter—the jet-powered *XH-17*—moved out of its hanger recently for a series of ground tests prior to a first flight.

The *XH-17* is powered by two turbojets supplying gas pressure through ducts lead-



The jet-powered *XH-17* helicopter.

ing up the rotor shaft and out to the tips of the long rotor blades.

The huge helicopter is designed for short-range moving of heavy military equipment, including artillery pieces, tanks, bridge sections, and trucks. In operation, it will straddle its cargo in a manner similar to that of a lumber lift, picking up loads by attachments to the landing gear and body.—News release.

Traveloader

The amazing diversity of loading platform levels—equaling in number the many models of cargo transport aircraft in operation—brings with it a host of problems to personnel in the air transport field. The chief problem is how best to push,



The Traveloader ready to load a $\frac{3}{4}$ -ton truck into an Air Force transport plane.

shove, lift, and squeeze boxes, cars, machinery, livestock, clothing, and the myriad other items carried by commercial and military services into the holds of the short, squat, low-slung, or long, narrow, high fuselages of transports with level or sloping floors, and with large or small doors?

To meet this challenge to human ingenuity, the Army Transportation Corps has come up with a piece of equipment which promises to be all things to all planes with all kinds of cargo. Called the Traveloader, it is being tested on different cargo transports in loading a variety of the supplies and equipment which the Army must ship to its units overseas or in the Zone of Interior. It is equipped with a hoist that raises and lowers the vehicular platform some 6 to 7 feet, extreme range. The cable and pulley hoist is centered in the chassis with the platform offset to one side. Heavy equipment and $\frac{3}{4}$ -ton trucks can be handled by the Traveloader.—*Aviation Age*.

Stratojet Bomber

The world's fastest bomber—the *B-47B Stratojet*—has been fitted with external fuel tanks to give it greater range. The 600-mile-an-hour, six-jet bomber also has been given more powerful engines.

Presumably, it now has the long-distance ability to deliver atom bombs—if it ever is called upon to do so—deep within any Iron Curtain country, and to return to a friendly base.—News release.

Adjustable Locomotive

The latest Army wrinkle is an adjustable diesel locomotive. This engine can run on tracks varying in width from the United States standard up to the widest gauges in use. A simple adjustment of the wheels on their axles does the trick.

Locomotive statistics show a 16-cylinder, 2-cycle diesel engine rated at 1,600 horsepower; a top speed of 77 miles an hour; satisfactory performance in temperatures from minus 40 degrees Fahrenheit to 125 degrees; and consumption of 40-octane fuel oil or lower.

The adjustable locomotive—the *MRS-1*—was built to Army Transportation Corps specifications. Thirteen of the units are scheduled for delivery.—News release.

Bore-Hole Camera

A bore-hole camera to photograph rock strata is being tested by the Army Corps of Engineers. In its present stage, it can take 360-degree pictures of a 3-inch-diameter bore hole. Further tests are expected to improve not only the camera's performance, but also its accompanying projection equipment.

The camera, cylindrical in form, can be lowered into a bore hole and operated electrically by means of a cable. Either dry or water holes can be photographed with equally good results. By use of a specially designed projector, the pictures can be viewed in undistorted form on a cylindrical screen.—*Ordnance*.

Stateside Tours Cut

The Army has announced that personnel returning from the Far East now will become eligible for new overseas duty after 9 instead of 12 months of duty in this country. Personnel returning from other overseas areas will be eligible for new foreign service again after 6 instead of 9 months.—News release.

Ration Heater

A flameless fuel unit to heat soldiers' combat rations in the field without producing tell-tale smoke that might give the soldiers' positions away has been developed by the Army Quartermaster Corps.

The flexible unit is wrapped around each can of field rations and is lighted with a match. It burns evenly without flame and heats the contents of the can to the proper temperature.

Ration heaters now being used burn with a flame that must be shielded from the wind. They also generate smoke hazards that might disclose the soldiers' whereabouts to the enemy. When rations are frozen, sometimes present-day heaters will not warm the food satisfactorily.—*Science News Letter*.

Export Curbs Eased

The Government has dropped export quota controls on synthetic rubber.

This removes restrictions on the quantity which may be sent abroad, but shipments still will require export licenses—aimed to see that none is sent to unfriendly nations.—News release.

Test New Landing Craft

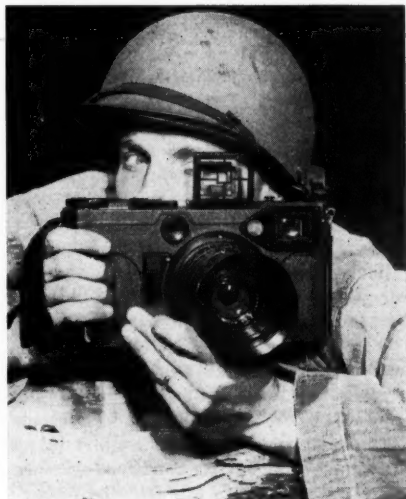
The Marine Corps is trying out a new type of landing craft that unloads from the stern instead of over a ramp in the bow like World War II boats.

The idea is that troops will be better protected from enemy fire if they can work along the sides of the boat.—News release.

New Combat Camera

The Army Signal Corps has announced the development of a greatly advanced combat camera that is capable of taking 10 pictures in as little as 5 seconds.

The new camera, which can withstand dust, light, fungus, moisture, or driving rain, makes an exposure every time the shutter clicks, and the film automatically



The Army's new 70-mm combat camera.

advances one frame while the shutter is cocked for the next shot. Double exposures are impossible.

Although the camera uses 70-mm film, it has all the advantages found in 35-mm miniature cameras, and can take 50 individual pictures— $2\frac{1}{4} \times 3\frac{1}{4}$ —on each roll. If only a few pictures are desired, the photographer can slice off as many exposures as he wants with a built-in knife. The camera automatically counts exposures, and when the film runs out a red flag pops up into the view finder.

Fully loaded, with 4-inch lens attached, the camera weighs only $5\frac{1}{2}$ pounds.—News release.

Construction Prediction

The Government predicted recently that a record 32 billion dollars would be spent for new construction this year. This would top outlays in 1951 by about a billion dollars.—News release.

Salvage Program

The salvage and sale of wastepaper by United States armed forces in Germany saved American taxpayers almost \$250,000 last year.

The paper, more than 2,500 long tons, was recovered at Army and Air Force installations.—News release.

Motor Vehicles

A record 52 million cars, trucks, and busses traveled the highways last year, burning up a record of more than 38 billion gallons of gasoline and diesel oil, according to a report by the Public Roads Bureau.—News release.

Combat Contact Lenses

The Army Medical Research Laboratory at Fort Knox, Kentucky, is conducting tests to determine whether contact lenses will enable riflemen, tank drivers, gunners, and other soldiers to lay aside hazardous, old-style spectacles while in combat.

Experience during World War II and in Korea has shown that glasses are easily broken or lost under field conditions. Moreover, reflection sometimes makes the wearer an attractive target for small-arms fire.—*Ordinance*.

Communist Air Force

It would cost the United States 250 million dollars a year to support a 1,700-plane air force such as the Soviet Union is furnishing to the Communists in Korea, according to the Air Force Chief of Staff. Moreover, it would take "something on the order of 1,900 tank cars of fuel and 100 freight cars of other supplies per month."—*Aviation Age*.

Steam Catapult

A new British steam-powered aircraft catapult, regarded as one of the important developments for naval aviation since World War II, will be adapted for use on United States carriers (MILITARY REVIEW, Apr 1952, p 68).

In recent tests, the catapult proved that it can hurl Navy jet fighters into the air even when the carrier is headed down wind or alongside a dock.—News release.

Jet Presses

The United States is seeking European help in building 17 mammoth superpresses for improving and speeding up jet plane output.

The Defense Production Administration said a government-industry team left for Europe to see whether steel for some of the giant forging and extrusion presses can be cast there.

Presses of this new type were developed and put into use in Germany during World War II. One such press can stamp out an entire plane wing or other section in one operation. The conventional method is to fabricate the section out of many small pieces.

The presses thus cut hours on the production line down to minutes, save on cost, and give the finished plane greater strength.—News release.

Power Plant

The Navy is converting a 7,000-ton vessel into a floating power plant, capable of providing 75 percent of the power needs for the largest Navy shipyard in event of emergency. Work has begun on the *MS Coastal Racer*, and completion is expected in about 2 years.

When completed, the steam-operated power plant will have a capacity of 34,500 kilowatts. At present, the largest Navy floating power plant is the 20,000-kilowatt *USS Jacona*, now based in Korean waters.—*Armed Force*.

DENMARK

Defense Directive

The Danish Ministry of Defense recently issued a directive covering the actions to be taken in the event that the country is invaded. In the event of attack upon Danish territory, or a Danish military unit outside Danish territory, the forces attacked are unhesitatingly to fight without awaiting—or seeking to ascertain—orders, even though any declaration of war or state of war be unknown to the respective command. Any attack upon Denmark or its constituted authorities is to be considered an order of mobilization. Home Defense forces are to meet immediately, a captive government is not to be obeyed, and threats of reprisals are to be disregarded.—Danish Information Office.

NORWAY

Salvage Project

About 15,000 tons of steel plates and scrap iron and some technical equipment have been salvaged from the German battleship *Tirpitz*, which was sunk in Tromsø Fiord, Norway, during the last war by Royal Air Force bombers.

It is hoped eventually to raise 40,000 tons of scrap iron and steel from the sunken hulk.—News release.

Walkie-Talkies

The United States Mutual Security Agency has allocated \$15,000 for the procurement of American radio tubes to be used in manufacturing 5,000 lightweight walkie-talkies for the Norwegian armed forces.

Scarcely larger than a soda pop bottle, the Norwegian walkie-talkie is ideally suited for use in rugged mountains and woods. Weighing only 6 pounds, it has a normal operating range of from 1 to 6 miles, but under favorable conditions it carries as far as 60 miles. Earphones are worn like a cap, and the microphone may be hidden in a mitten.—Norwegian Information Service.

ITALY

Ship Construction

Italy recently laid the keel of her first destroyer since World War II, and announced plans for the construction of five more.—News release.

BULGARIA

Monetary Reform

A drastic monetary reform tying Bulgarian money to the Soviet ruble and virtually wiping out currency holdings was announced recently by the Sofia radio.

All Bulgarian lev notes outstanding in the hands of the population were ordered exchanged for new notes at the ratio of 100 old leva for 1 new lev. More favorable rates of up to 25 old leva for 1 new lev were inaugurated for savings deposits.

Simultaneously with the revaluation, the rationing system was abolished and prices for foodstuffs were lowered.

The new exchange rate makes the lev worth 1.7 rubles. The previous rate of exchange was 100 leva for 1.4 rubles. The ruble has the nominal official value of 25 cents, but it is a purely domestic Soviet currency.—News release.

YUGOSLAVIA

Population Increase

New census figures recently released fix Yugoslavia's population at 16,338,504, an increase of 566,397 over 3 years ago. Belgrade's population is 390,733.—News release.

EGYPT

Mineral Deposits

Rich deposits of iron ore and other minerals have been discovered by four geological expeditions in the eastern desert of Egypt.

Encouraged by these discoveries, the Egyptian Government is contemplating the use of airplanes to make an aerial exploration of the entire desert region, only a small part of which has been surveyed.—News release.

NEW ZEALAND

Fighter Squadron

The Prime Minister has announced that New Zealand is planning to send an Air Force fighter squadron to the Middle East for garrison duty.—News release.

CZECHOSLOVAKIA

Jet Planes

The Defense Minister has announced that Czechoslovakia is producing jet planes with the assistance of the Soviet Union.—News release.

Air Service

The Prague radio announced recently that a Czech air line is establishing regular service between Prague and Communist China.

The broadcast stated that an agreement between Czechoslovakia and the USSR permits the air line to fly passengers, freight, and mail over the USSR to China, thereby establishing "the only direct service connecting Europe and all other countries with China."—News release.

JAPAN

United States Bases

The United States-Japan Joint Committee reported recently that 13 naval and 12 air training areas had been created for use by the United States forces in Japan. All of the areas are on or near Honshu, the main Japanese island, or Kyushu, the southernmost island.—News release.

Sunken Submarines

Japanese salvage men are hunting for 45 lost submarines, once the pride of the Imperial Navy.

The submarines, most modern in the fleet, were secretly scuttled somewhere in the landlocked "inland sea" of central-southern Japan.

When they are found, they will be raised and broken up for scrap to relieve the critical shortage of steel.—News release.

TURKEY

Women in the Armed Forces

The Turkish General Staff is giving consideration to the employment of women in the armed forces.

According to tentative plans, women will be engaged in service work, but will not be assigned to combat duty. They will have their own distinctive uniforms and carry their own insignia of rank.—Turkish Information Office.

BRAZIL

Development Project

Brazil is engaged in a vast project for the development of the Sao Francisco River, which is believed to be the largest enterprise of its kind ever undertaken in South America. When completed, the project will help to develop an area considerably larger than any country in Western Europe.

Almost 85,000 square miles with nearly 7½ million inhabitants will be affected by it. It will have an eventual output of more than a million horsepower of electric energy that will go out to more than 200 municipalities in the states of Bahia, Alagoas, Sergipe, Pernambuco, and Paraiba.

This new source of electric power is expected to have a tremendous effect on the economic growth of the region.—*The New York Times*.

GREENLAND

Building Program

Shipyards, quays, schools, hospitals, water supply installations, and fishermen's houses are to be built in Greenland this year under an extensive Danish Government investment program.

Greenlanders also may be offered a scheme for buying new houses through their local stores. Under a proposed Government scheme, the islanders would be able to get a state loan through the shops to help buy prefabricated houses built in Denmark.—News release.

AUSTRALIA

Rear-Facing Seats

Australia's Civil Aviation Department has announced that all new types of civil aircraft flying in Australia soon will be required to have the passenger seats facing the rear (MILITARY REVIEW, Aug 1951, p 70).

Tests have shown that this type of seating arrangement should cut fatalities in air accidents by at least 25 percent.

Australia will be the first country to make the rear-facing seats compulsory.—News release.

Antiexposure Suits

The Royal Australian Air Force has ordered more than 1,000 new-model anti-exposure suits from Great Britain. The suits are a combination antiexposure outfit and dinghy for use in subzero temperatures.—Australian News and Information Bureau.

Electric Power

Electric power stations at present under construction in Australia will more than double the present generating capacity of 2½ million kilowatts.

Stations now in the planning and construction stages are estimated to cost 430 million dollars. It is expected that they will be progressively completed in the next 5 years, the speed of construction being dependent on availability of labor, materials, and equipment.—Australian News and Information Bureau.

Timber Program

The Australian Government will contribute half of the capital of a 4½-million-dollar company to cut 10 million feet of timber a year in New Guinea.

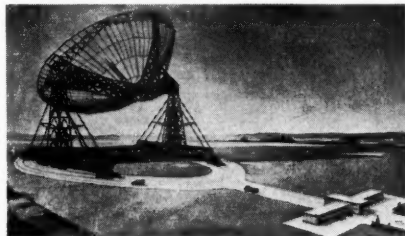
The cutting will be done in a 40,000-acre forest in the Bulolo Valley, which is estimated to contain 500 million feet of timber.

By cutting 10 million feet a year and replanting new trees, the company will ensure that the timber never runs out.—*The Christian Science Monitor*.

GREAT BRITAIN

Radio Telescope

A giant radio telescope weighing 1,270 tons is to be built in Britain to map unexplored regions of the universe. It will enable scientists to pick up signals from invisible stars sent out hundreds of millions of years ago from outer space. These high pitched messages may be the birth



An artist's sketch of the radio telescope.

cries or death gasps of stars which have either ceased to exist or are not yet capable of emitting light.

Shaped like a huge electric fan with a diameter of 250 feet, the "steerable paraboloid aerial" will rotate on a platform mounted on two 185-foot elevating racks. Completely adjustable, it will be free to scan any desired region of the sky. The instrument will not be affected by clouds or fog and research will be possible during the hours of daylight and in all kinds of weather. The total cost is expected to be approximately \$940,800.

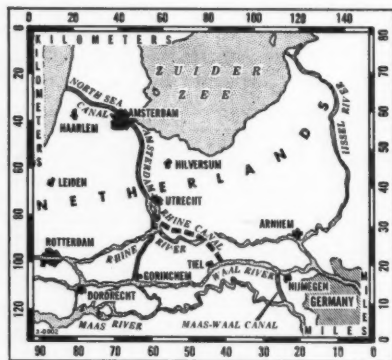
It is expected that the new equipment will put Britain far ahead in the new science of radio astronomy which reaches out into space beyond the limits of the most powerful optical telescopes.

In addition to studying radio emissions from invisible stars, it will be used to plot the intensity of radiation from important regions of the Milky Way which are obscured from normal vision by layers of cosmic dust and to obtain data on the sun, the moon, visible stars, and meteors.—British Information Services.

THE NETHERLANDS

New Canal Link

The largest inland navigation lock in the world and a new stretch of canal linking the heavy river traffic of inland



Europe with the North Sea were opened recently in the Netherlands.

The 45-mile-long Amsterdam-Rhine Canal, including the new 20-mile segment, will take ships up to 4,000 tons and halve the shipping time between Amsterdam and the Rhine.—News release.

Jet Fighters

The Dutch Government is negotiating to build under license two of Britain's latest jet fighters—the Vickers Supermarine Swift and the Hawker Hunter. The Dutch intend to build and assemble the planes with Belgian-made engines.—News release.

PAKISTAN

Recognize Vietnam

Pakistan has decided to recognize the Bao Dai Government of Vietnam, one of the associated states of French Indochina.

By her move, Pakistan became the second Asian nation to recognize the French-sponsored Government of Vietnam, Thailand already having done so.—*The New York Times*.

WESTERN GERMANY

Steel Production

West German steel makers announced recently that they expect to increase production to 16½ million tons a year next year—a million tons more than Great Britain. This would make Western Germany Europe's biggest steel producer, preceded in the world only by the United States and the Soviet Union.—News release.

Teaching Program

Some 25 secondary school teachers from Western Germany and Berlin will go to the United States this month, and the same number of American high school teachers will come to Germany, to teach in each others' schools for a year.

Under this new program, German teachers of English and American teachers of German will be mutually exchanged between communities of comparable size and type for a school year. The German school will continue to pay the salary of its teacher while in the United States, and the American school will also pay its teacher while in Germany. The United States Department of State will provide transportation for both groups of teachers, as well as a cost of living allowance to the German teachers.—*Information Bulletin*: (Office of the US High Commissioner for Germany).

Security Controls

The Allied-German "peace contract" unclamps all but two controls over Western Germany's industrial machine.

That means that the big Ruhr steel mills again can produce such items as artillery weapons, shells, tanks, and similar military items.

Security controls, however, stipulate that arms production must be under authority of the European army. The other bans production of atomic weapons, guided missiles, bacteriological weapons, and poison gas.—News release.

CANADA

Radar Installations

The Royal Canadian Air Force has announced that United States Air Force personnel will man a number of radar installations being built in Canada.—News release.

Planes Replace Tugs

The Canadian aircraft carrier *Magnificent* towed itself out to sea recently—by air power.

Eleven *Avenger* torpedo bombers were lined up, moored securely to the flight deck, and cranked. Pilots gunned the planes' engines, and the pull generated by the propellers towed the 18,000-ton warship smoothly out of Halifax harbor.

The planes were so placed that by regulating the speed of their various engines, the carrier was able to turn and maneuver as if tugs were prodding her along.

Naval officers said this pull-yourself-by-your-bootstrap method was speedier than the conventional tugboat tow.—News release.

Immigrants

Canada's Immigration Minister has announced that that country probably will admit 100,000 to 150,000 immigrants this year, compared with last year's near record total of 194,000.—News release.

Sabre Production

The Minister of Production recently told the House of Commons that Canada is producing *F-86 Sabre* jets twice as fast as originally planned, and that production is expected to be doubled again by the end of the year.—News release.

Naval Planes

Canada is going to send 60 to 70 surplus naval planes to the Netherlands as part of her contribution to the integrated North Atlantic Treaty Organization defenses.—*The New York Times*.

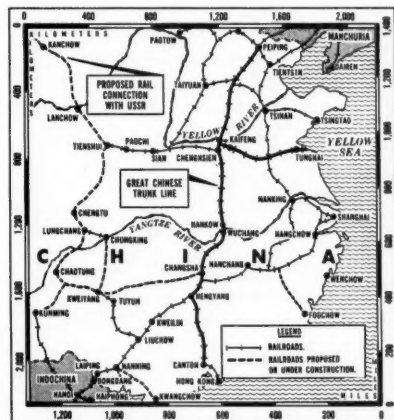
COMMUNIST CHINA

Rail Construction

The construction of new railroads has an important place in Communist China's preparations for industrialization.

Most important of the number of construction projects already in process or in the planning stage is the extension of the Lunghai Railroad to Lanchow, capital of Kansu Province, and possibly beyond.

Another major rail project is the con-



struction of a line linking Chungking and Chengtu, two major cities of southwestern Szechwan Province.

Railroad engineers also are surveying the mountainous terrain between Chengtu and Lanchow so that the isolated Chungking-Chengtu line may be tied in to railroads leading to the principal cities and ports in eastern China.

The Communists also are busy in southeast China. Their new railroad from Laiping south to the Indochina coast has been in operation since last November, and surveys are being made for a line connecting Nanning with the Gulf of Tonkin. Moreover, additional surveys are underway in other parts of China.—*The Christian Science Monitor*.

USSR

Don-Volga Canal

The Don and the Volga Rivers were linked recently through a newly completed canal that forms a part of an immense waterway that eventually will extend from the Baltic to the Black Sea (MILITARY REVIEW, Feb 1951, p 72).

The Don-Volga Canal is the first to be completed of five postwar construction



The Don-Volga Canal (1) is part of a system making possible navigation from the Baltic Sea to the Caspian by means also of the Moscow-Volga (2), Mariinsk or Lenin-grad (3), and Baltic-White Sea (4) Canals.

projects described as "the great edifices of communism."

Construction of the Don-Volga Canal began before World War II, was interrupted by the German invasion, and was resumed in 1947.

The first link in the system, a 91-mile canal across the steppes from Stalingrad to Kalach, will enable small sea-going vessels to ply between the Baltic, the White, the Caspian, the Azov, and the Black Seas.

According to the plans, the Aral Sea will become a part of this waterways system by 1957 when the world's longest canal, the Turkmen Canal, will bring the Aral waters 900 miles to the Caspian.—News release.

UNION OF SOUTH AFRICA

Air Navigational Aids

South Africa's Department of Transport is speeding plans for developing a network of air navigational aids in the Union. Orders for radio beacons and other vital apparatus have been placed with overseas manufacturers, and the equipment will be set up as soon as it is received.—*The Aeroplane*, Great Britain.

EASTERN GERMANY

Rearmament Program

The Communist East German Government has disclosed plans for a vast rearmament program, to include the 2 million members of the Communist Free German Youth and workers in all key industries.

The aim is an army of 25 divisions with 375,000 men, backed up by millions of East Germans organized as Communist militia.

High schools are giving courses in fire-arms, military communications, and aerodynamics; and "armed defense corps" are being organized in major factories.

Under the rearmament program, every East German—regardless of age or sex—is ordered by the Communists to "do your part in defending our homeland."—News release.

HUNGARY

Aluminum Production

Communist Hungary is engaged in a determined effort to raise her output of aluminum and of bauxite, the raw material from which aluminum is made, according to the Budapest radio.

Last year Hungary produced about 33,000 short tons of aluminum, 20 times the prewar output, and a further substantial increase is sought this year. Hungarian bauxite production, more than half of which is exported to the Soviet Union, is scheduled to be raised 53 percent this year as against the 1951 output.—*The New York Times*.

FOREIGN MILITARY DIGESTS

A Criticism of Air Power Strategy

Digested by the MILITARY REVIEW from an article in "The Hawk,"
The Journal of the Royal Air Force Staff Colleges (Great Britain) December 1951.

THE publication of Major de Seversky's book *Air Power: Key to Survival* has drawn attention, both in the United States and in this country, to how the military forces of the North Atlantic Treaty Organization (NATO) countries should be built up. The lowering of living standards, and the setback to economic recovery resulting from the vast sums of money devoted to provide armaments, makes the subject of vital importance to the peoples of these countries. They will want to know that the money they are providing will build the forces needed for their security. The author says the acceptance of air power strategy is a matter for the American people to decide, because only the United States has the industrial capacity to produce the air force that would be required. This is no doubt true, but, as the NATO countries are bound together by the treaty, whatever strategy the people of the United States decide will directly affect the security and independence of the other countries concerned.

It may be thought in this country that the case for air power strategy presented by Major de Seversky represents the extreme view in the United States, but the recent almost successful attempt to curb

the President's power to send United States divisions to Europe is a measure of American public opinion which favors the strategy, and of the powerful support it has in the United States Congress.

Marshal of the Royal Air Force Lord Trenchard has recently stated that the book represents more nearly his own views than anything he has heard or read before. This alone would be sufficient to warrant a study of the strategy and its implications. That neither the United States nor Great Britain appear to have accepted the strategy but are actually building the balanced land, air, and sea forces, which Major de Seversky strongly criticizes as being made obsolete by air warfare, may well cause some concern among those peoples who are sacrificing so much to provide forces to meet the danger which threatens them.

Air Strategy Theory

The strategy which the advocates of air power propose is based on the primary assumption that total war between the Soviet Union and the West is inevitable, and the vast resources of the Soviet Union in manpower and surface weapons would place the Western powers at a disadvan-

tage. If the United States economic and military effort is directed at an attempt to stem the tide of Soviet hordes, the result would be the swallowing up of the American forces piecemeal and a subsequent withdrawal, from all bases on the Eurasian Continent, with enormous losses in manpower and equipment. At this stage, the battle would have to be carried out from the Americas. Such a battle would develop into an interhemisphere war which could only come to a successful conclusion by the building of a mighty force of long-range strategic bombers. These aircraft would first obtain air supremacy over the Soviet Union, and finally reduce her to a state of collapse by disrupting her economic system and, thereby, eliminate her ability to continue the conflict, although her armies in the field would be undefeated.

The logical strategy evolved from this assumption is to accept that the Eurasian bases cannot be defended, to withdraw all United States forces to the American Continent before a war started, and to concentrate, immediately, on building a strategic air force capable of striking at the Soviet Union from the American Continent. In this way, the argument continues, the war, if it starts, could be brought to a speedy conclusion, since the forces of victory would be already at hand and the national effort would not be wasted in attempting to hold overseas bases that are indefensible. By accepting this strategy, advantage would be taken of America's great industrial capacity and technological superiority over the Soviet Union to forge an air force with which she could not hope to compete. The occupation, by the Soviet Union, of the whole of Europe (with the possible exception of the British Isles), the Middle East, India, and Southeast Asia is accepted as inevitable and unfortunate. However, if the peoples of these countries understand air power strategy they will realize that only by this means can their liberation come speedily and cer-

tainly. There would be little danger to cities and peoples in Soviet-occupied countries because air bombing would be directed at vital targets in the Soviet Union. The theory, at least from the United States point of view, is attractive; it eliminates the need for conscripting vast numbers of men in ground armies and relegates naval forces to an auxiliary role with the consequent reduction of expenditure on those arms. It postulates victory through air power alone, which is now widely accepted as being proved. To support the view, lessons of World War II are drawn upon. The defeat of Japan is cited as the main precedent, for here was a nation defeated by air bombing of the homeland while the ground forces in the field were largely intact. Whether this is true, and whether the Soviet Union, occupying all of Asia and Europe, could be similarly bombed into submission, does not form the basis of this criticism. If the postulation is accepted, the question is whether the strategy would meet the threat with which the Western nations are faced.

Soviet Intentions

To determine to what extent the strategic air power policy would be successful, it is necessary first to assess the danger which threatens the free countries. The Soviet Union's broad international policy is well known; it has been stated briefly by W. Bedell Smith, American Ambassador to Moscow from 1946 to 1949, as: "Soviet policy has always been directed toward the ultimate goal of world revolution and Communist world domination... and will continue to be, so far as can be foreseen, in the future."

To achieve this aim, the Soviet Union has two principal methods. She can either embark on total war or prosecute her policy by all means short of total war.

The Possibility of Total War

To embark on total war with any chance of success, she would require an industrial

capacity at least equivalent to that of the United States together with the technological ability to back it up. These are vital requirements and there is little doubt that the Soviet Union is so far behind in both that any geographical and manpower advantage which she may have would not make up the deficiency. That the Soviet Union is fully aware of her deficiency in industrial capacity and technological ability can be seen in many of her actions.

Industrial Capacity

Stalin, in his much quoted speech in 1946, gave figures which indicated that the Soviet Union, together with her satellites, had an industrial productivity $4\frac{1}{2}$ times less than the United States at that time. To reach the United States level would take four or five Five-Year Plans, say by 1963 at the earliest. Attainment of the required parity earlier could be achieved only by industrial control of all Germany, France, and Italy. There is some evidence to show that the Five-Year Plans are not as successful as was hoped, so that even with the industrial capacity of Western Europe added to her own, the Soviet Union has little hope of bringing the date forward by an appreciable period.

Technological Ability

The Soviet Union's backwardness in technological ability is probably more important than her industrial capacity, for without it her industry cannot develop and become efficient. The highly organized international spy system maintained by the Soviet Union provides ample evidence of her inferiority in this respect. Her fantastic claims for inventions in every field of science also is an indication of this weakness. They may be explained by her desire to impress on the satellite countries that, by being members of the Soviet system, they will benefit from the best technological advice in the world.

Apart from these two factors, there are other indications that the Soviet Union

is not yet prepared for total war. Take for example her unwillingness to use force during the Berlin blockade and the failure to intervene with her armed forces in Greece, Iran, and Korea. Had she decided to act, there would have been the moral backing of Communists and supporters throughout the world, and armed conflict with the Western powers would have been provoked at a time when her military superiority in the field was absolute. Also the vigorous political campaign with which the Soviet Union is opposing the rearmament policy of the NATO countries would be of little point if she is bent on total war. The 40 or so divisions which are planned for European defense under NATO could hardly hope to prevent the 150 Soviet divisions, which could be deployed against them, from occupying Western Europe. The probability is, therefore, that the rearmament policy adopted by the Western powers is likely to frustrate some other Soviet plan which does not involve total war. Thus, the Soviet Union is not likely to embark on a third world war, because she is aware that the chance of ultimate success is small. There is evidence to show that she is sensitive concerning her inferiority in the industrial and technological fields, superiority in which is a basic requirement of victory, and that her position in relation to the United States cannot be greatly improved for at least 10 years.

The Other Alternative

The alternative method of achieving world domination is by all means short of total war. This would be a continuation of the present process of maintaining world tension, threatening total war, "war by proxy" on the Korean pattern, and extension of communism through Communist-front organizations. At the same time, full advantage would be taken of discontent in Western countries, caused by the need for rearmament, to initiate strikes and foster international instability both po-

litically and economically. In this cold war, Stalin holds the initiative and it is not easy to see how it can be recovered by the Western powers. By postponing their economic recovery, and by reducing the standard of living to rearm, the Western powers are creating the internal conditions on which communism thrives. If they fail to rearm, they will be vulnerable to "war by proxy."

It would seem that the Soviet intention is not to embark on a third world war, but to continue her present policy by all means short of total war, for by this method she has a better chance of achieving her aim of world communism. Military operations by this method would be confined to satellite wars on the Korean pattern. Therefore, the danger is not from the Soviet Union's 150 divisions, but rather from the considerably lesser force which the satellite countries could put in the field.

Application of the Strategy

If the Soviet Union then is unlikely to initiate a third world war during the next 10 years, the concentration on strategic air power alone by the United States would not provide the force to meet the danger with which we are faced. On the contrary, by withdrawing military aid from the Eurasian Continent, which the strategy requires, the Soviet Union would be encouraged to launch her satellite states on new adventures on the "war by proxy" model. Without military aid from the United States, in the form of balanced armed forces, the free democracies would have little chance of defending themselves, because the inevitable strain on their economy to produce the armed forces needed for their defense, together with Soviet intimidation, would almost certainly lead to unstable government and possible internal revolution. This is particularly true of France and Italy, who have strong and active Communist Parties. The threat of retaliation by the strategic bombing of the

Soviet Union is not likely to cause concern in the Kremlin, because the Soviet Union would not be directly involved. The bombing of Soviet targets by the United States would be branded as aggression, and would be unlikely to have the moral backing of the American people or those of allied countries. Certainly in the eyes of some 500 million people in the world who have signed the Stockholm Peace Appeal, such an act would be regarded as outright aggression. Strategic bombing of the satellites responsible would be no more successful than the "strategic" bombing of North Korea. The only solution in this case appears to be balanced land and sea forces, supported by a strong tactical air force, with the maximum aid from the United States in these arms.

A 'Preventive' War?

It has been suggested that the United States might wage a "preventive" war against the Soviet Union. In such a war, full use would be made of America's advantage in atomic weapons. However, now that the Soviet Union is building her own stock pile of atom bombs, the chance of a quick decision without retaliation in kind is rapidly receding. A "preventive" war, if it is to be fought, would have to start very soon. The opportunity may have already passed. The only means of undertaking such a war would be by strategic air power, because, as recent events in the Far East have shown, neither Britain nor France would support America, and she would, consequently, be denied the most suitable bases and facilities for launching an attack. The interhemispheric strategic air force, however, is not available and could not be ready for some years. A "preventive" war to be undertaken by the United States must, therefore, be ruled out, for, although it may be the best way of removing the Soviet menace, the weapons required for victory could not be provided in time for its success to be assured.

A Soviet Miscalculation

There is a possibility that the Soviets might make a miscalculation which would lead to total war. This is most likely to happen in one of the more dangerous areas where there is direct contact between Soviet and Western armed forces, or in places of vital importance to Western economy—Germany, Austria, and Iran are examples. The best way of avoiding such a catastrophe would be for the treaty countries to make quite clear which areas they are prepared to defend, and to provide the necessary balanced forces for the purpose. Soviet prudence might then prevail and she would take steps to ensure that no mistakes are made.

The adoption of the strategic air power policy by the United States would, therefore, encourage the Soviet Union to take the very step which it is in the best interest of the United States to prevent—the occupation of Western Europe—and hasten the time when the Soviet Union could undertake a third world war under the most favorable circumstances. By providing full military assistance for the treaty countries, the United States has the best chance of containing the advance of communism in the foreseeable future. In this way, the Soviet Union may eventually be forced to modify her aim of world domination and seek a co-operative understanding with the Western powers.

The 'Curve of Expectancy'

If, after a period of some years, the Soviet Union continues to maintain a state of world tension, during which her industrial capacity and technological ability are brought to an equivalent or higher level than the United States, the real danger of another war may develop. It may be fought on the interhemispheric pattern as visualized by Major de Seversky, but the strategy is more likely to be modified to suit the effectiveness of new weapons that will certainly be developed. Trying to forecast the development of new weap-

ons is not easy, as even many present-day weapons are closely guarded in a shroud of secrecy. If what Major de Seversky calls the "curve of expectancy" can be applied, it may, however, be possible to predict the general trend.

In World War II, air power came to be recognized as an essential part of warfare, and as important, if not more so, than land and sea power. In past wars, the success of the offensive by land and sea lessened according to developments in defensive weapons. It is probable that in the future, the success of the air offensive will be subject to the same limitations. There are indications that within the next 10 years or so, the defense against the piloted strategic bomber will be in the ascendant. Such a development would lead to a stalemate in air warfare to be ended only by the introduction of a new weapon. This new weapon may be the long-range intercontinental guided missile. Similarly, the development of new defense weapons on land may once again reduce land warfare to a stalemate as in World War I. Much has been said of the offensive aspect of atomic weapons, but it may be that the defensive possibilities are even greater. In the Smyth Report of 1945, it is concluded that "the fission products produced in 1 day's run of a 100,000-kilowatt chain-reacting pile might be sufficient to make a large area uninhabitable." The sealing off of a frontier, or at least those parts which are not easily defended by conventional weapons, with radioactive substances with a half-life of up to 2 years may be a feasible proposition within the next 10 years. At sea, the main threat is from the submarine, but recently there have been official announcements that this problem too may be satisfactorily solved within the next few years.

It is possible, therefore, that with the development of new weapons, the advantage will once again be with the defense and military strategy will have to be modified accordingly. The strategy

based on the mobile offensive in ground warfare and strategic bombing in air warfare, which was the predominant feature of World War II, could well become the "Maginot mentality" of World War III.

Conclusion

The inadequacy of the air power strategy, as proposed by Major de Seversky, lies mainly in its failure to assess the means by which the Soviet Union can achieve her aim of world communism. There is evidence to show that the Soviet Union has no desire to initiate a third world war, and that she is fully aware of her inability to bring such a war to a successful conclusion. The adoption of air power strategy, and the withdrawal of United States military aid from the Eurasian Continent, might hasten the time when the Soviet Union would feel justified in taking the risk.

It is more probable that, in the foreseeable future, the Soviet Union will limit her expansion by military means to "war by proxy" on the Korean pattern. The best way of meeting this threat is for the United States to provide aid in the form of balanced military forces to those countries which are prepared to contain communism within its present confines. That this policy is the best method of frustrating Soviet plans is supported by the vigorous political measures she is taking to oppose the rearmament now being undertaken by the North Atlantic Treaty countries. If the United States continues to support this policy of containment, a third world war may be averted until the development of new weapons makes the piloted strategic bomber as obsolete as the Maginot Line was in World War II.

Men, Mass, and Technique

Translated and digested by the MILITARY REVIEW from an article by Major Bror von Vegesack in "Ny Militär Tidskrift" (Sweden) No. 12, 1951.

MEN, mass, and technique are three factors that have always exercised a decisive influence on the outcome of a war. At different times, one of these three factors has stood out as the most important, but never has any one of the three failed to play a vital role.

Psychological Defense

Psychological defense, particularly, comprises many fields. It is based not only on enlightenment with regard to what the objective of the combat really is, the moral obligation to defend freedom and independence, and the wrong in bowing to force, but also on acquaintance with one's own factual possibilities of standing up under attack, and comprises, therefore, the feeling of self-confidence, which has its roots in the faith in one's own weapons,

in the competence of one's own leaders, and in the thoroughness and effectiveness of one's own training. This enlightenment must be imparted before a war stands at the door. Time is required for grasping and assimilating the situation. With the arrival of hostilities, so many new impressions and practical problems come crowding in upon the individual that no place is found for anything more.

The Human Factor

The human factor must still be accorded the same great weight it has always had, for the character of modern war is still the same in this respect. Moreover, the frightful weapons of modern war have increased the need of the individual's capacity for resistance.

Since the days of antiquity, the problem

of the few against the many has existed. Mass, however, by no means, has always been the conqueror. No less in Swedish war history has the numerically inferior now and then triumphed over mass. The human factor, in combination with technique, has showed its superiority over numbers; however, to underestimate the role of mass is to court disaster. It is, indeed, an important factor in war's complex equation.

Mass versus Technique

In our days, the question of *mass* versus *technique* is discussed with special liveliness, but the question is not formulated in a completely objective manner. Thought is channeled in the direction of colonial warfare where small, well-armed, elite formations have conquered primitively armed hordes with no interior strength. However, today's mass armies are well equipped and scorn no technical aids. Atom bombs are found today in the East as well as in the West, even though they vary in numbers and, perhaps, effectiveness. The armies of the Eastern powers also possess interior strength which is supported by an ideology instilled from early youth. From the West's point of view, the question is posed how we, with better technique, may overcome the combination of mass and technique.

It may be of interest, in this connection, to touch briefly on the intimate relationship between mass and technique.

Scientific Contributions

War has always been given a technical turn, if one measures its technique by contemporaneous standards. Even in the days of antiquity, the scientists and technicians of that time contributed in making the apparatus of war more effective. For men like Archimedes, Aristotle, Euclid, Galileo, Leonardo da Vinci, and others, military technique was an important field of activity. Their contributions, however, were only of local importance; science was not, as yet, international.

Engineering science was fostered by the armed forces. It was a very long time (the 1800s) before the military engineer got his civil comrade, the civil engineer. Time was then ripe for a mighty evolution in technique.

The great discoveries which followed one after the other, at this time—the steam engine, the propeller, the telegraph, the telephone, and the internal combustion engine—made possible motorization's forward march, and, at last, the conquest of the air revolutionized the very mode of human existence.

Industrialization began its victorious march over the earth, mass production became possible, means of communication were further developed, and technique became international. The art of war also derived benefit from this extensive civil technique. Through mass production, it became possible to arm mass armies; through the extension of the communication network, it became possible to move mass armies to distant areas and concentrate them in the masses seen in the two world wars; through the use of the telegraph, telephone, and radio, they could be led; and through the employment of the airplane, war could be waged against the areas back of the fighting forces. Civil technique was just as applicable to military ends as the purely military engineering art. Today, we are not able to differentiate between civil and military technique; they are meshed together to an immeasurable degree—they are identical.

Use of Technical Aid

Although technique is international and its application in military fields has determined the pattern for modern military procedures, including the mass employment of men and matériel, there exist, naturally, considerable differences between the various countries in the manner in which they make use of technical help. This was obvious during World War II. To begin with, the Soviet Union was not

organized for a technical war, but was forced, by pressure of circumstances, to draw on all her scientific capabilities. Despite this fact, a crude but effective military technique emerged. The finer points came from the West, but they were often copied with great skill. The Hitlerian dictatorship was not able to gather together the scientific talent in an all-out collaboration in the war. Many scientists fled to the United States where they contributed effectively, among other things, to the creation of the atom bomb. Germany, the technical country "par excellence," lost in the scientific race, time after time, during the war, in spite of the fact that the initial situation was in Germany's favor.

To a large extent, this situation must be attributed to Germany's more limited resources and to Hitler's strategic mistake in staking all on a short war, but it may also be attributed to the lack of freedom and security under the dictatorship which stifled personal initiative.

In the West, on the other hand, the scientists co-operated voluntarily and with enthusiasm in the development of military technique. For centuries, the scientists had been collecting a reservoir of knowledge, which was now suddenly made available to the art of war. In it was found a great mass of unexploited data that could be used. The atom bomb and the perfection of radar were the most widely known products of this new collaboration. However, in countless other fields, the scientists also contributed in making the war machine effective. By means of electrical computing machines, many years of long and tedious labor were saved, new materials such as plastics began to be used, new and more efficient manufacturing methods were tried out, and scientific methods of analysis were employed with astonishing success in the problem of military strategy. After the war came to an end, with the two atomic explosions over the Japanese cities,

the veil was lifted from this enormous collaboration between the scientists and the military. The newspapers vied with one another in publicizing this new and amazing field. Technique and science were again in the limelight. Future war was depicted as a scientists' war.

Future Possibilities

It is obvious that the knowledge of the scientists has been turned only in part to military uses. Portions of the knowledge painstakingly accumulated through the centuries are still unused and untested. However, there is now, in time of peace, a thorough inventory of these untested portions in progress, and we have reason to look for many innovations in the future. Especially serious is the fact that the prerequisites exist for bacteriological warfare, where, by means of the spreading of sickness and toxins, there appears to be great possibilities of obtaining very considerable effects against an enemy who is less well prepared in this respect. In the matter of chemical warfare, there are also many innovations to be noted. The tactical atom bombs are a new branch on the atomic weapons tree, and research in the field of the hydrogen bomb points to entirely new possibilities. We certainly have reason for giving attention to science and technique!

Science has striven to become international. One of the causes of the great scope of its expansion has been this extension over international boundaries.

East versus West

The greater part of scientific knowledge is, therefore, available to the scientists of both the East and West, and even so small a country as our own does not have such poor possibilities of following along in scientific developments. In the face of the day's uncertain political situation, the Iron Curtain hides many of the new scientific and technical advances, and the international character of science has be-

come obscured. Let us hope, however, that this is only a temporary situation. The race in the laboratories goes on on both sides of the Iron Curtain.

It can thus be seen that extensive scientific material exists on both sides of the Iron Curtain, a sufficiency to promise many advances. It seems, however, as though the Western countries possess the greater possibilities of availing themselves of the new matériel and achieving results more rapidly than the dictatorship in the East with its (for scientists) more oppressive atmosphere. Likewise, in the matter of industrial development of the new weapon and its mass production, the West has better resources. In the West, technique has a greater scope. The East has mass and technique, but the question is, How well have they worked out and perfected them? That one is wise in taking the Eastern powers technical knowledge seriously is attested to by the Soviet atom bomb.

Analyzing the Situation

The present question of *technique* versus *mass* has many aspects, whose mutual connections are comprehended only with difficulty. Today, no mass army is able to appear on the field of battle without the support of a comprehensive home industry. Mass does not consist of men alone, but of men with arms, tanks, guns, and planes. However, there can exist a

great difference in important details. Perhaps the West's tanks have slightly better armor, travel faster, and are more accurate in their fire, as well as being alone in the matter of effective night combat means. Possibly the West's planes and instruments are a shade better than the East's corresponding types. Tactical atom bombs are not, as yet, found in the East. These are details, but important ones. It could be upon them that the entire balance of power hangs. Therefore, it is so important that all the possibilities of technique must be developed to the greatest possible extent. In time of war, one benefits thereby in the form of smaller losses; in time of peace, additional knowledge and technical ability are won which can be of use to science in many fields.

Summary

Men, mass, and technique will constitute tomorrow, as today and yesterday, important military factors. It is not their sum or product, but a synthesis of them, that forms military strength. As for our own part, it is necessary that we concentrate on the two factors, men and technique, that we ourselves, with our resources, are able to develop. Our defense technique also must be guided in its efforts, by the possibilities of our having to face the combination of mass and technique. We have resources, and we should use them.

American industry has shown its fitness for the enormous task involved in making this Nation the arsenal of democracy. These tasks are being repeated almost daily as we look into the realm of the wonder weapons. We must continue our scientific programs aimed at equipping our forces with the most advanced and superior weapons which can be developed in order that they may overcome the overwhelming numerical advantage of our potential enemies.

Brigadier General Henry M. Black

Limited and Unlimited War

Digested by the MILITARY REVIEW from an article by
J. M. Spaight in "The Royal Air Force Quarterly" (Great Britain) January 1952.

ABOUT 150 years ago, Clausewitz propounded his theory of "limited and unlimited wars." It is more or less a commonplace now, but it was new then. Clausewitz saw that there was one class of war where the political objective was so important to both belligerents that they would tend to fight to the utmost limit of their endurance to secure it. However, there was another class of war where the objective was of less importance, that is to say, where its value to one or both of the belligerents was not so great as to be worth unlimited sacrifices of blood and treasure. It was these two kinds of war which he designated provisionally *unlimited* and *limited*.

Unlimited wars tend to be fought to the bitter end. Limited wars do not; they culminate usually in some kind of bargain or compromise. As we know from experience, a call for unconditional surrender is not unheard of in the one kind of war; in the other, in all normal circumstances, it is inconceivable. Moreover, there are other differences. The limited wars of the future are likely to be localized, cordoned-off, contained wars; the unlimited wars of the future are likely to be more or less global wars. However, the most important difference for the present purpose is that in the one kind of war the means of destruction will probably be (voluntarily) limited, in the other they will not. The belligerents will pull their punches in the limited wars; in the unlimited wars they will probably throw everything they have at the enemy. The unlimited wars are fairly certain to be wars in which there is a first-class power engaged on each side, and, consequently, a trial of strength, the issue of which will be nothing less than the survival of one or the other of the

great powers. The necessity of survival has been the main plank in the platform of advocates in the United States of uninhibited strategic bombing. The morality of such a manner of warfare depends, it is argued, on "whether a blitz application of total force is essential to security" and "whether our code of morals is more entitled to survive than that of the enemy." One cannot conceive that the question of the survival of the American way of life could arise in any war less than a major one. The issue in a limited war will be of less gravity for any great power that may be engaged in it.

The limited war, it must be emphasized, is not a war from which all but the attacking nation and the attacked stand aside and leave it to the immediate parties to fight out. In an article in *Foreign Affairs*, Mr. Hamilton Fish Armstrong stated that Greece, Turkey, and Yugoslavia had little or no belief in "the possibility of a localized war." They believed, he said, that the Western powers would be forced to intervene if any of the three countries were attacked. That is probably true, but it could still be a limited war. A limited war is something entirely different from a "piecemeal" war in which each country is left to shift for itself and is overwhelmed in turn.

The Korean Conflict

The conflict in Korea is an example of a limited war, in the sense of being not only a localized war, but one of which the issue, though a great principle was at stake on the United Nations' side, was never a matter of life or death for any major power. It was, therefore, never likely to be fought to the last ditch. *The Times* stated, in a leading article of 18 August 1951, re-

ferring to the cease-fire talks at Kaesong: "Both sides, the United Nations explicitly, the Chinese tacitly, have expressed the opinion that this is not a war which could profitably be fought to a finish." It might easily have become, however, an unlimited war. The United States decision to abstain from any action against the real bases of the Communist forces in Manchuria probably prevented that country from getting involved in the wrong war at the wrong place at the wrong time with the wrong enemy. In other words, the United States was reserving its strength for the big affair that might be coming.

It has been asked, "Why were the Communists granted the right of sanctuary?" An American senator made a practical reply to this question during a speech in Washington when he stated that "there are still other sanctuaries . . . Washington and New York and Detroit and Denver and San Francisco. If American planes fly over the Chinese mainland, if American-assisted troops try to invade that mainland, if American ships attempt to squeeze it in a total blockade, how much time will elapse . . . before you and I listen day and night for the air raid sirens here in Washington?"

The Lesser Evil

There was implicit reason in the senator's words for hoping that limited war, of the old pattern, may become the fashion again and that the world wars of which we had such terrible examples in 1914-18 and in 1939-45 may be avoided. It is in the interests of the big powers, but not of them alone, that this should happen. It is not a matter of the big powers saving their own skins. The United States and others are very definitely not doing that in Korea. It is only an acknowledgment of the truth that limited war is the lesser of two evils. The task of the future will be to stifle the small wars before they blaze out into big wars. Wars are conflagrations, and it is in the interest of all nations

that they should not be allowed to spread. An unlimited war is an unrelieved disaster for mankind. A limited war is bad enough, but it is not nearly so catastrophic in its impact and consequences. That is due, in part, to the fact that it is likely to be fought with weapons whose capacity for mass destruction is far less than those which probably would be used in a major conflict.

In Korea, as we know, the atom bomb was not used. According to a spokesman of the American Air Force, there was no objective worthy of it there; but would it have been used if there had been? There were worthy objectives in China, but, actually, Chinese territory has not been bombed at all to date. Had the war been a major one, in all probability there would have been a very different tale to tell. Peiping could hardly have escaped in that event. There is in the city, right in its center, an important military objective, the so-called East Station, the main railway terminus. It adjoins the great gateway of Chien Men, where the Tatar and the Chinese cities meet and which is the channel of an unceasing flow of traffic between the north and south parts of Peiping, a moving mass of pedestrians, cyclists, motor vehicles, donkey carts, and rickshaws. One can imagine what the effect would be if a massive bombing attack were made on the station and the piles of dead and dying that would be heaped in the streets.

Moderation in Small Wars

That, at any rate, did not happen, though voices were heard demanding that something no less calamitous should. There is bitter fighting in Korea, and the death roll is piteously long, but the destruction and the slaughter that has occurred is probably inconspicuous, compared with what it would have been if a major war had started. There is definite evidence of a desire on the allies' side to conduct the military operations without resort to the

extremities of violence that had marked the final stages of World War II. Similar restraint may not be shown in an all-out conflict of major powers. Peace, it used to be affirmed in the days of the League of Nations, is indivisible. The dogma was always challengeable. Still more questionable would be an assertion that war is indivisible. Obviously, it is not. It can be split up into major and minor wars. The minor war is a kind of safety valve which can serve to prevent the major explosion. In all probability, it is only in great wars that use would be made of the fearsome instruments about which the prophets of evil warn us. They would not be used in minor wars for various reasons—because the wars *are* minor and do not call for an all-out effort, because the belligerent who has the new weapons in his armory would not wish to disclose the existence of them prematurely, because they will probably be very costly to produce and may be limited in supply, so that the tendency will be to reserve them for a really great occasion.

Air Operations in Limited Wars

The part which the strategic air offensive will play in a limited war will probably be less prominent than that which would be allotted to it in an unlimited one. In Korea, there is more tactical than strategic action in the air. Even the *Super-*

fortresses have been taking a hand in the work of co-operation with the ground forces. Ground forces are likely to continue to be primary for some years to come in all kinds of wars, but more especially in wars of the Korean type. In global wars, the long-range bombers, the successors of the *B-36*, will come into their own. In minor wars, there will be a tendency to revert to the pattern, brought up to date in some respects, of the wars which had been waged before instruments of mass destruction had been developed to their present proportions and of which the repercussions and consequences, bad as they were, were far less serious than would be those of a major, all-out conflict today.

A famous Frenchman, asked for his views on hell, replied that no doubt it existed, but he believed it to be uninhabited. One might misappropriate that idea for the present purpose and say that there is, doubtless, a kind of war which would be hell with the lid off, because the weapons employed in it would be so murderous. However, the odds are that none of us shall see *that* hell. The fact that these appalling instruments of destruction may be used in a great war will go far to prevent its coming. They are less likely to be used in small wars for the reasons already given.

We do not have a choice between fighting in Korea or not fighting at all. Our choice lies between fighting in Korea or fighting somewhere else—somewhere more difficult—and probably somewhere closer to home.

President Harry S. Truman

Combat in Cities

Translated and digested by the MILITARY REVIEW
from an article in "Militaert Tidsskrift" (Denmark) April 1952.

IT HAS always been a difficult task to attack a city, and, for this reason, forces engaged in offensive operations have attempted to avoid such undertakings. Nevertheless, during World War II, time and time again, cities became the focal points of the fighting.

Reasons for the Change

Two of the major reasons for this recent change in warfare can be listed as follows:

1. The modern motorized army is strongly bound to the roads and is obliged to conquer the cities which dominate the road junctions in its zone of advance, in order to ensure the movements of supplies and reserves.

2. Many cities possess tactical or strategic significance for the attacking force. For example, a city may control a river passage, as at Arnhem, a valley, as at Monte Cassino, or possess an important port, as at Cherbourg—or it may have psychological value and be attacked for reasons of prestige.

Combat Characteristics

Combat in cities differs from combat in open terrain in many ways, namely:

1. It is difficult to locate the enemy because visibility is poor (buildings, smoke, and dust) and the noise of his weapons is reflected and reinforced.

2. Co-ordination and control are difficult because the field of combat cannot be surveyed, and the usual means of communication and liaison are unreliable or impractical. Moreover, the plundering carried on by otherwise well-disciplined troops is a frequently occurring phenomenon during combat in cities, and can cause an attack to come to a standstill, resulting in

irreparable harm to the troops' morale and discipline. Therefore, combat in cities, whether offensive or defensive in character, requires that all personnel are well trained, well disciplined, and eager for combat.

It is wrong to believe that the defense of a city can be left exclusively to its home guard or civil population, despite the fact that such ideas have been, and are being, expressed rather freely. It is true that the workers in Stalingrad succeeded in such an undertaking, but it is also true that the average Soviet industrial worker had generally received military training that surpassed the training of the average member of a Western European home guard.

Soviet Experience

The Soviet Union probably gained more experience in combat in cities than any other country during the last war, for the Soviets fought for and lost some of their own cities, later won them back, and, toward the end of the war, captured many enemy cities.

Although the Soviets have been somewhat reluctant to share their tactical experiences with the Western powers, many Swedish military publications have, through the medium of Soviet articles and studies of operational methods used during the war, formed for themselves a picture of the Soviet tactics in an attack on a city.

The Soviet Pattern

Before the attack is launched, painstaking preparations are made, including thorough reconnaissance and the use of intelligence studies, special training for the troops which are to be engaged, and a rehearsal of the anticipated action stressing the teamwork required between the infantry, artillery, and tank units.

Launching the Attack

The attack is begun by the tanks and reconnaissance forces who surround the city and attempt to cut off all routes to and from the city. An advance force, supported by strong artillery, launches an attack after the initial encirclement has been completed, in order to tie down and immobilize the defense forces. After this action has begun, the main body of the attacking forces moves around the city and attacks it from the rear and the flanks in an effort to decentralize and paralyze the defense effort.

Organization of Assault Units

During the fighting in the city, the attacking forces are divided into a number of assault units, each consisting of the following four sub-units:

1. An *attacking unit*, composed of light infantry (armed with machine pistols, hand grenades, and knives), flame-thrower units, and forces equipped with smoke generating apparatus.
2. A *supporting unit*, armed with machine guns, antitank guns, assault artillery, and tanks.
3. A *reinforcing unit*.
4. A *reserve unit*.

Action Against Weak Resistance

If the resistance is relatively weak, the attacking unit moves forward along both sides of the street, firing at windows, doors, balconies, and roofs on the opposite sides of the street. The supporting unit follows closely behind and lays down fire on barricades and buildings from which resistance is offered. A few tanks travel on each side of the street and lay down cross fire in the same manner that the infantry does, while other tanks travel farther behind and fire down the streets.

Action Against Strong Resistance

If the resistance is strong, the attacking unit attempts to enter buildings through holes shot in the walls by the supporting unit, and then works its way from building

to building by way of the attics and roofs, or through the basements, clearing each building in turn. In the buildings where resistance is encountered, an effort is made to get above the defender and force him into the open or down into the basements. In the latter case, he can be smoked out by setting the buildings on fire, or drowned by breaking the water pipes.

Vigorously defended strong points are held down and blinded by fire and smoke while the first wave passes, and then are attacked by the second wave.

A Major Question

At this point, it might be well to ask: "Would a Western European city have any chance of holding out or defending itself against an attack as described above?" The answer is *yes*, for the defender has many advantages in such a situation, as compared with the attacking enemy.

Defensive Advantages

Not only does the defender know the routes within the city and the location of underground passages and sewer lines, but he has the advantage of cover and previously prepared strong points. If he has had time to prepare barricades, demolitions, and mine fields, the defender is in a much better position than the attacker, who, until he has obtained a foothold in the city, is obliged to maintain himself on a glacis created by scorched-earth tactics.

Strong Defense Forces

If the defense has adequate strength to offer strong resistance, defense positions are established along the entire outer edge of the city so located as to afford good fields of fire and adequate cover and protection for the weapons and their crews. Inside the city, additional positions are established and reserves located so that the defense can maintain all-round protection and co-ordinate the launching of counterattacks.

Weak Defense Forces

On the other hand, if the defense forces are relatively weak, the defense generally is concentrated around the most important penetration routes and the vital sections of the city, while the unmanned portions of the city are defended by prepared artillery fires, snipers, and patrols.

In either case, outposts are established

themselves on all sides and provide mutual support for one another.

The defense is conducted in such a way that the enemy will be hindered as long as possible from getting a foothold in the city, and, when he has finally pushed into the city, his attack is channelized as much as possible so that the defender can bring down concentrated fires to destroy him.



Allied infantrymen moving down a rubble-littered street in Waldenburg, Germany; a scene typical of much of the fighting in World War II.—Department of Defense photo.

about 6 miles or more beyond the outer edges of the city, and, in addition, the area around the outer edge of the city is mined to whatever extent time, forces, and matériel permit.

The Defensive Organization

Normally, each defense position consists of resistance areas composed of a number of strong points. Generally, a strong point is organized in a large building or a designated area of the city, and defended by a reinforced platoon. Such strong points must be able to defend

Every officer and man must be imbued with a will to fight, and must not let any possibility for a surprise burst of fire or counterattack go unexploited.

Exploiting the Advantages

If the enemy forces his way into a building, the defender must take advantage of the fact that he is the one who prepared the building for defense and is, therefore, able to exploit its advantages. He must continually inflict losses on the enemy; expose him to ceaseless surprise; and make him fight for every room, every hallway, and every stairway.

The Arming of Our Maritime Reconnaissance Squadrons

Digested by the MILITARY REVIEW from an article by Wing Commander K. R. C. Slater in the "Journal of the Royal United Service Institution" (Great Britain) November 1951.

IN CONJUNCTION with the Royal Navy, the role of the Coastal Command is to safeguard our sea communications. At the present time, the Soviet Union and her satellites are the most dangerous potential enemies with whom we must reckon, and intelligence regarding Soviet naval forces indicates that we must be prepared to contend with two main threats to our shipping in the event of war. First and foremost, there is the Soviet underwater fleet, estimated to consist of between 300 and 500 submarines of all types, as compared with the 60 possessed by Germany in 1939. Second, the Soviet Navy is believed to have under construction a number of fast cruisers, specifically designed to operate as commerce raiders.

Should hostilities break out, therefore, one of the primary tasks of the Royal Navy and our maritime air forces will be to secure the safe and timely arrival of shipping against underwater attack and against attacks by surface raiders. Accordingly, the purpose of this article is to review the role of our Coastal Command and naval reconnaissance squadrons in countering these threats, and to consider how they should be armed to meet the possibility of war in the immediate future.

Functions of Reconnaissance Aircraft

Defense Against Mining

Mining the approaches to ports and harbors is a type of operation for which submarines are particularly suited and, in view of the known emphasis placed by the Soviet Navy on mine warfare, we must expect this form of attack to be developed against us on a large scale, either just prior to, or immediately following, the outbreak of war. It is likewise conceivable that enemy submarines may also operate

midjet units in an attempt to plant atomic mines inside our major ports. If successfully delivered, attacks of this nature could disrupt our maritime communications far more effectively than the sinking of ships at sea.

However, the mining of inshore waters by submarine calls for extremely accurate navigation, if mine fields are to be correctly located and the operations carried through without undue hazard. This means that submarines must carry out the final stages of their approach at periscope depth in order to obtain the observations required to fix their position, and in doing so they are obliged to expose themselves to the risk of detection from the air. Hence, the first step in countering minelaying operations by a submarine lies in the provision of standing air reconnaissance patrols over threatened areas.

Once located, it is important that submarines should be attacked immediately, since they represent fleeting targets of opportunity which must not be allowed to escape. On the other hand, the equipment required to track and kill a submerged submarine can only be carried in fairly large and expensive aircraft, so that when surface craft are available to strike swiftly upon receipt of sighting reports from the air, as would normally be the case in the vicinity of main ports, then it is usually more economical to rely on surface craft to kill, using aircraft primarily as a means of detection. Thus, the first function of our maritime reconnaissance forces is to provide standing antisubmarine spotting patrols over the inshore approaches to ports and harbors.

Antisubmarine Defense in Focal Areas

In mid-ocean, evasion is probably the most effective method of safeguarding

shipping against underwater attack. However, all sea communications converge on focal areas, such as the western approaches, where a large concentration of targets is unavoidably presented to the enemy and evasion can no longer be exploited as a means of defense. Hence, it is against the focal areas that the enemy must be expected to concentrate his maximum underwater effort and, unless forced to retreat by the effectiveness of our countermeasures, his initial offensive may be disastrously successful. Accordingly, it is essential that sufficient antisubmarine forces be deployed in these areas to deprive U-boats of all freedom of action and to ensure their destruction whenever and wherever located.

Because of their ability to search vast stretches of ocean at high speed, the use of aircraft is clearly the most economical means of denying the enemy freedom of action, provided that once submarines have been located means are available to neutralize them effectively. At the present time, since ships equipped with asdic are still able to hunt and kill submerged submarines with greater precision and reliability than is possible using airborne equipment, it seems likely that the close protection of shipping will continue to be carried out by fast escort frigates for some years to come. Thus, aircraft operating in the immediate vicinity of convoys should be able to call upon ships to attack submarines as soon as they are sighted.

However, with the advent of long-range, pattern-running torpedoes, our best chance of protecting convoys against underwater attack is to kill submarines before they can position themselves to strike. To this end, antisubmarine offensive sweeps must be operated continuously throughout each focal area, and although the ideal method of carrying out such sweeps is to employ hunter-killer combinations of ships and aircraft, it often happens that ships cannot be spared for the purpose, at which

times the task will have to be undertaken by aircraft operating independently. Hence, the two main functions to be performed by reconnaissance aircraft in the submarine defense of focal areas are, first, to act as the eyes of convoy escort ships and, second, to carry out antisubmarine offensive sweeps either with or without the support of surface forces.

Antisubmarine Defense in Mid-Ocean

We have previously noted that the underwater threat to our convoys in mid-ocean is unlikely to become serious until the build-up of our counteroffensive has succeeded in driving U-boats away from the focal areas. Therefore, on reaching this stage, it is imperative that we should continue to wrest the initiative from the enemy by forcing him to remain on the defensive. To do this, we need to provide for the close tactical defense of our convoys as economically as possible, so that our maximum effort can be devoted to operating offensive patrols in enemy transit areas with the threefold object of:

1. Locating and killing submarines before they are in a position to threaten our shipping.
2. Forcing enemy submarines to remain submerged, thereby minimizing their chances of intercepting convoys, first, by reducing their radius of action and, second, by restricting opportunities for visual and radar search.
3. Gaining intelligence regarding the disposition of enemy submarines so that convoys can be diverted away from threatened areas.

As was mentioned previously, the close tactical defense of convoys is best undertaken by surface ships operating with the assistance of spotter aircraft. On the other hand, owing to the vast distances which must be continuously patrolled, primary responsibility for carrying the offensive into enemy transit areas is best undertaken by long-range reconnaissance

aircraft, capable of operating effectively against enemy submarines with or without the support of surface forces.

Defense Against Surface Raiders

From the enemy point of view, the main advantages to be gained from the use of surface raiders lies not in the number of ships sunk (though this may well be considerable) but in the loss of shipping capacity imposed upon us indirectly, by the need to reorganize our convoy escort system, once the presence of a surface raider is suspected, and also in the vast naval and air effort which must be deployed in order to hunt even one cruiser class raider. Therefore, in order to minimize the disruptive effect of an enemy surface raiding campaign, it is imperative that raiders should be cornered and destroyed as soon as possible after they have put to sea. To this end, our maritime reconnaissance squadrons have a vitally important part to play, their task being to locate raiders immediately after their presence has been disclosed and to shadow them until they can be engaged by an adequate force.

Summary of Functions

Having reviewed the principal functions of maritime reconnaissance squadrons, in relation to each of the major threats, these functions can now be summarized as follows:

1. Continuous antisubmarine reconnaissance of inshore waters.
2. Antisubmarine spotting in support of convoy escort frigates.
3. Continuous antisubmarine sweeps of focal and transit areas with or without the support of surface forces.
4. Search and shadow patrols against enemy surface raiders.

Influencing Factors

Since ships and submarines can remain at sea for weeks at a time, regardless of weather, it is clearly essential that mari-

time reconnaissance aircraft should be capable of detecting them by day or by night in all conditions of visibility. This means that aircraft must be able to carry all the necessary search equipment, together with the crew needed to operate it, and to maintain an efficient visual lookout for the maximum period the aircraft is likely to be on patrol.

Cost of All-Weather Facilities

It is important to bear in mind that quality is no substitute for quantity in maritime reconnaissance operations, which frequently involve the maintenance of standing patrols over large areas. Indeed, where antisubmarine operations are concerned, the mere threat of aircraft overhead is usually sufficient to deprive U-boat commanders of their freedom of action, almost regardless of the type of aircraft employed. Therefore, in these circumstances, quantity is even more vitally important than quality. Hence, it is important that aircraft intended for maritime reconnaissance duties should be cheap to produce and operate in large numbers, so far as this can be achieved without sacrificing other essential requirements.

Ship-Borne or Shore Based?

In deciding when it is preferable for maritime reconnaissance aircraft to be ship-borne and when they should be shore based, it is necessary to consider the nature of the task, the availability of aircraft carriers, and the size of aircraft involved. If the task is one involving tactical reconnaissance, in conjunction with convoy escort forces or a naval task force, then it is plainly an advantage if the aircraft can be operated from a ship. Not only are ship-borne aircraft on the spot whenever required, but their use eliminates a prodigious waste of effort which would otherwise be involved in transit flying from shore bases.

On the other hand, the use of ship-borne aircraft to carry out tasks such as anti-

submarine sweeps in enemy transit areas at present involves committing a valuable aircraft carrier, together with its attendant escort. In such circumstances, the use of shore based aircraft may frequently be more economical. Indeed, the availability and huge cost of operating fleet carriers is likely to restrict severely the use of aircraft which can only be operated from ships of this size.

In this connection, it must be appreciated that the construction of even one fleet carrier absorbs a significant proportion of our national resources in highly skilled manpower and material—quite apart from the large crew and elaborate docking facilities required to keep her in commission. Moreover, giant aircraft carriers are exceptionally vulnerable to air and surface attack, and need the protection of a surface antisubmarine screen—in fact they may even have to be escorted by cruisers, or a battleship, if there is any risk of encountering heavily armed enemy units. Thus, the deployment of these great ships automatically gives rise to a defensive commitment for which it may not always be possible to provide the necessary forces.

During the last war, small escort carriers and dual purpose merchant aircraft carriers were produced quickly and at a comparatively low cost, but the restricted size and speed of this type of carrier imposes severe limitations on the payload and performance of any conventional aircraft with which they can be armed. In this connection, it is important to note that the latest fleet reconnaissance aircraft, the Fairey *G.R. 17*, cannot readily be operated from anything smaller than a light fleet carrier.

Nevertheless, where, for example, the requirements of air defense make the presence of a fleet carrier essential, then the potential value of these larger units as bases for antisubmarine reconnaissance aircraft must be fully exploited, since only

in this way is it possible to reap the maximum dividend from the capital resources invested in the carrier and its escort. Considerations such as these may therefore justify the use of carrier-borne aircraft for reconnaissance purposes which could otherwise be fulfilled more economically by shore based aircraft.

In some cases, of course, the size of aircraft required for particular tasks virtually precludes the possibility of operating them from ships. For example, all the crew, together with the search equipment and armament, required to track and kill submerged submarines entirely without the support of surface forces, can only be carried satisfactorily in very large aircraft which must inevitably be shore based. Generally speaking, however, in the absence of special considerations, it seems reasonable to conclude that aircraft intended primarily for tactical reconnaissance in the vicinity of convoys or naval task forces should normally be ship-borne, while aircraft required to carry out strategic reconnaissance and independent antisubmarine sweeps should be shore based.

Landplanes or Flying Boats?

From the military aspect, the choice between landplanes and flying boats for maritime reconnaissance duties is governed primarily by strategic factors which vary according to the theater in which the force is to be disposed. Flying boat designers generally agree that in speed and load carrying capacity, the landplane is inevitably superior to the flying boat until an all-up weight of about 300,000 pounds is reached, after which, because of the massive weight of the undercarriage assembly in giant landplanes, the advantage switches to the flying boat. It is also indisputable that the maintenance, refueling, and rearmament of flying boats at moorings involves difficulties and delays not suffered by landplanes, with the result that a far higher utilization rate is possible with the latter type of aircraft.

On the other hand, there is no doubt that, strategically, the ability of flying boats to operate in all types of weather from primitive and indestructible bases can be extremely valuable. The cost and delay involved in building airfields is completely eliminated, enabling this type of aircraft to be switched rapidly from one area of operations to another in a matter of hours. Such an advantage is tremendous in maritime warfare where threats may develop anywhere within a vast theater of operations, necessitating frequent adjustment to the deployment of maritime reconnaissance forces. On balance, then, where there is a deficiency of strategically well-placed airfields, the greater mobility of the flying boat far outweighs its technical shortcomings in comparison with landplanes.

Examining the availability of landplane and flying boat bases in British or friendly territory, in relation to the defense of our sea communications, it is evident that there are enough airfields flanking the North Atlantic and Mediterranean sea routes to provide for their complete coverage by landplanes. In the Indian Ocean and elsewhere, however, airfields are few and far between, whereas there is an abundance of suitable flying boat bases from which all important routes can be adequately patrolled. Hence, it appears that the greater part of our shore based maritime reconnaissance force should consist of landplanes, with additional flying boat squadrons for use mainly in the Indian and Pacific Oceans.

Summary of Requirements

To summarize, therefore, we see that maritime reconnaissance aircraft should be inexpensive and capable of detecting the enemy in all types of weather; also that tactical reconnaissance aircraft should be of a type which can be operated equally well either from ships or shore bases. Aircraft intended primarily for strategic reconnaissance and antisubmarine sweeps,

however, should comprise part of a shore based force consisting mostly of landplanes in the Atlantic and Mediterranean and of flying boats elsewhere.

Types of Aircraft Required

The general requirements for maritime reconnaissance aircraft having been established, it is now appropriate to consider types of aircraft for use in particular roles. In doing so, reconnaissance tasks may be divided into three broad categories, namely those which are primarily concerned with spotting the enemy; those which involve striking him at the same time; and those concerned with locating and shadowing surface raiders.

Spotting Aircraft

Antisubmarine patrols over inshore waters, and in the vicinity of convoys and naval task forces, are mainly concerned with locating the enemy so that he can be attacked by surface ships. For this purpose, therefore, we need an aircraft having the following characteristics:

1. Capable of being operated in all types of weather from either shore bases or small, dual-purpose carriers such as the merchant ship carriers of the last war.
2. Good endurance.
3. Adequate radio and search equipment.
4. A large enough crew to maintain an efficient visual search; that is, at least a crew of three.
5. Striking power to kill a surfaced or snorkeling submarine (this is desirable but not absolutely essential).
6. Cheap to produce and operate in large numbers.

Of the requirements listed above, the first is undoubtedly the most difficult to fulfill, and, within the immediate future, it virtually restricts our selection to a choice between conventional aircraft, of a size and performance comparable with the venerable *Swordfish*, blimps, or helicopters.

Conventional aircraft in the *Swordfish*

category have the advantage of being reasonably cheap to produce while experience in the last war shows that they can be operated fairly successfully at night and in bad weather conditions. Nevertheless, the extent of deck space required for take-off and landing necessitates the provision of an elaborate and expensive modification to the superstructure of a merchant ship. Moreover, the need to head the carrier into the wind when flying on and off is a serious handicap when ships have to be sailed in convoy.

The United States Navy has made extensive use of blimps for inshore patrols and convoy escort duties, and there is no doubt that, given suitable weather conditions, they can be employed most effectively in this role. Not only is the endurance of this type of aircraft measured in days rather than hours, but it should be quite feasible to devise means of replenishing and refueling them from merchant ships when necessary. Moreover, since there is no inherent limitation to the size of these aircraft, they can readily be adapted to carry all the crew, equipment, and armament required to track and kill submerged submarines. On the other hand, blimps are exceedingly expensive to build and operate and are also very vulnerable to antiaircraft fire, added to which they cannot be used in regions where there is any risk of encountering severe icing conditions. This latter disadvantage inevitably rules out the possibility of utilizing them in the North Atlantic during the winter.

Trials to evaluate the usefulness of helicopters for maritime reconnaissance purposes are now being carried out on both sides of the Atlantic. Recent experience in Korea has demonstrated the ability of helicopters to operate reliably either from ships or shore bases under exceptionally difficult conditions and the use of these aircraft for antisubmarine spotting patrols would appear to offer many advantages. In the first place, they are not

unduly expensive, if produced in large enough quantities; second, they can be flown on and off a small deck-space and it should, therefore, be relatively simple and inexpensive to modify suitable types of merchant ships, in considerable numbers, to serve as dual-purpose carriers; and, third, it should be quite feasible to design a helicopter having an endurance of between 3 and 5 hours, to carry a crew of three and the radio and search equipment for antisubmarine reconnaissance.

The most serious drawback to helicopters, in their present stage of evolution, is the severe strain imposed upon the pilot during prolonged flights and the extreme difficulty of flying them on instruments and at night. However, an automatic pilot is now under development, and when this is available it should minimize pilot strain, and, at the same time, greatly improve the all-weather and night flying characteristics of this type of aircraft.

Thus, reviewing the comparative suitability of conventional aircraft, blimps, and helicopters for antisubmarine spotting purposes, it is evident that although conventional aircraft are capable of meeting most requirements, their use demands the provision of carriers which are expensive to improvise and which have to be headed into the wind when flying on and off. In the case of the blimps, while they can be most effective, given suitable weather conditions, they are very costly to build and are unsuitable for use in the North Atlantic route in winter. Helicopters, on the other hand, are free from the disadvantages associated with the other two types of aircraft, but, at the present time, are unsuitable for carrying out prolonged flights or for use at night or in bad weather. On balance, however, given the necessary priority in development, it is evident that helicopters should be capable of satisfying our requirement for a large number of ship-borne spotting aircraft more nearly, and more economically, than

is possible by using either blimps or conventional aircraft.

Offensive Reconnaissance Aircraft

Offensive reconnaissance patrols are mainly concerned with locating and killing enemy submarines, and for this purpose an aircraft is needed which incorporates the following characteristics:

1. Range and endurance.
2. Adequate radio, all-weather search equipment, and a large enough crew to maintain an efficient visual search throughout the patrol.
3. The equipment required to track a submerged submarine for a prolonged period.
4. Striking power to kill a submarine, whether surfaced or submerged.
5. Capable of defending itself against fighter attack.
6. Cheap enough to produce and operate in large numbers.

Previously, we concluded that, in the absence of special considerations, it is preferable for aircraft engaged on offensive reconnaissance to be shore based, in which case a radius of action of 1,000 miles, with 4 hours on patrol, would seem to be a reasonable interpretation of our first requirement. Unfortunately, however, this requirement directly conflicts with our need for an inexpensive aircraft, and, in practice, an aircraft designed to incorporate the characteristics we have specified will have an all-up weight of around 100,000 pounds; the *Shackleton* and the United States Convair *PBY* being typical examples.

The cost of building giant aircraft of this kind is prodigious. Hence, in order to increase the total number of aircraft obtainable within the limit of our resources, it is desirable to equip a proportion of our squadrons with smaller types, such as the United States Navy *Neptune*, which has an all-up weight of 67,000 pounds, or the Short *Solent* at 78,000 pounds. The former aircraft is able to

carry a somewhat smaller crew (7 instead of 10) and much the same equipment as in the case of the giants, although, with this load, its radius of action is only about half that of the larger types. Of course, the introduction of two categories of shore based aircraft for offensive reconnaissance inevitably reduces the over-all flexibility and efficiency of our force, but this disadvantage is outweighed by the vital need to deploy aircraft in the numbers required to saturate focal areas.

In discussing the role of carrier-borne aircraft, we observed that when fleet carriers are required in an area for purposes of air defense, they should also be used as bases for antisubmarine reconnaissance aircraft. Therefore, a carrier-borne antisubmarine aircraft is required, incorporating substantially the same characteristics as those specified for similar shore based aircraft, with the exception that a much shorter range is acceptable. In practice, however, it is virtually impossible to operate, from a carrier, aircraft large enough to lift the crew, equipment, and armament needed to track and kill submerged submarines entirely without the support of surface forces. Therefore, in considering the type of aircraft needed, we are forced to choose between three possibilities, namely:

1. To operate aircraft in pairs; for example, one aircraft carrying search equipment and the other tracking equipment, together with the killing weapon.
2. To operate aircraft as spotters, relying on surface ships to deliver attacks.
3. To compromise by operating aircraft primarily as spotters, while providing them with the means to cripple a submarine pending attack by surface ships.

The system of operating aircraft in pairs is unacceptably extravagant, since it virtually halves the effort available for reconnaissance purposes. On the other hand, since submarines represent fleeting targets of opportunity, they should be at-

tacked on sight whether or not surface forces are available for the purpose. Hence, the best answer, seems to lie in adopting the compromise represented in the design of the Fairey G.R. 17 which, although primarily intended as a search aircraft, is also armed with a striking weapon.

Hunting Aircraft

As long as they have the means to protect themselves against fighter attacks, aircraft equipped to carry out long-range antisubmarine reconnaissance are eminently suited for use on search and shadow patrols against enemy surface raiders. Special aircraft are not, therefore, required for this role, which can be coupled conveniently with that of antisubmarine offensive reconnaissance in all squadrons whether carrier-borne or shore based.

Summary of Types Required

The various types of aircraft for which we have established a requirement may now be summarized as follows:

1. Helicopters for antisubmarine spotting in support of surface forces; for example, patrol of inshore waters and convoy escort duties.

2. Long-range landplanes and flying boats (around 100,000 pounds all-up weight) for long-range antisubmarine offensive reconnaissance and for search and shadow patrols; for example, antisubmarine reconnaissance in transit areas.

3. Medium-range landplanes and flying boats (around 70,000 pounds all-up weight) for medium-range antisubmarine offensive reconnaissance and for search and shadow patrols; for example, antisubmarine sweeps in focal areas supported by surface forces.

4. G.R. 17 type aircraft for antisubmarine offensive reconnaissance from light fleet carriers supported by surface forces.

Parliamentary announcements have stated that the present intention is to arm the Coastal Command with *Shackletons*, *Nep-tunes*, and *Solents*, while naval reconnaissance squadrons are to be equipped with the G.R. 17. It is reassuring to note that the equipment of squadrons with these aircraft is now going ahead. But what of the helicopters needed for tactical reconnaissance?

Without helicopters, the Coastal Command and carrier-borne aircraft, intended for offensive reconnaissance, must be diverted from their primary role in order to carry out defensive inshore and convoy escort patrols. To dissipate our striking force in this way is to invite defeat by surrendering the initiative to the enemy and allowing him freedom of action to concentrate against us at will.

Conclusion

Twice, since 1914, aggressors have sought to conquer us by submarine blockade and twice they have brought us to the verge of defeat. The success or failure of a third attempt may well be decided by our ability to utilize helicopters for maritime defense.

It is true that, at present, the capacity for the development and manufacture of helicopters is extremely limited in this country. Nevertheless, given the necessary priority, this capacity could be rapidly expanded and, if necessary, it should be possible to purchase licenses from the United States to produce suitable American types pending development of our own designs.

The task of equipping and training an adequate force of helicopter squadrons for the Royal Navy will take years to complete, and it is imperative that it should be started without further delay. The force is needed now!

Employment of Commonwealth and United States Field Artillery

Digested by the MILITARY REVIEW from an article by
Captain G. A. Wood in the "Canadian Army Journal" January 1952.

UPON emerging victorious from a major war, one is inclined to feel that his own army corps or service is the most efficient and brilliant of them all, irrespective of the performance of his comrades and allies. This is a healthy attitude, provided it is not carried to a ridiculous extreme. Being a gunner of the Canadian Army, I was afflicted with a similar feeling about my own arm to the partial exclusion of the merits of the artillery of other armies, and more especially of those outside the Commonwealth.

Having been assigned to the United States for a tour of duty, and, in the course of this tour, having met a number of very fine United States artillery officers, I have been obliged, being a reasonably fair man, to admit that perhaps gunners other than British and Canadian are able to employ artillery, and quite effectively, too. In this article, which I hope will assist us in understanding the United States artilleryman and his ways, I am attempting to compare the methods of employing field artillery at the battalion-regimental level used by the field gunners of the United States and Commonwealth forces by pointing out the more prominent similarities and differences between the two systems.

I do not intend to compare the technical capabilities of ourselves as opposed to the United States artilleryman except to state that, from what little I have observed of United States gunnery methods, the American artilleryman need take off his hat to no one.

The United States divisional artillery battalion is organized on a three-battery basis, there being six guns in each battery. There are three light artillery battalions in the infantry division, armed with 105-

mm howitzers, and one battalion of mediums, consisting of eighteen 155-mm howitzers. This adds up to a total of 72 howitzers in the divisional artillery, a fourth of them being mediums.

The Canadian organization, on the other hand, provides three field regiments for the infantry division, each consisting of three batteries of eight guns. This gives a total of 24 guns in the regiment and 72 in the division, all being light artillery equipment. Therefore, it is apparent that the American division has slightly more fire power in its divisional artillery than we, by virtue of having the heavier caliber equipment. Whether or not this is the right balance of fire power is a matter for conjecture and, no doubt, opinions will vary greatly in both services.*

Battery Organization

One of the principal differences between the two services lies in the battery organization. In the Canadian battery, we have two troops each of four guns and a battery headquarters troop. The latter is responsible for administering the gun troops, co-ordinating the battery survey, and providing the battery command post. Each gun troop is able to fire independently of the other and without assistance or direction from the battery command post. It has its own troop command post which is responsible for controlling the fire of the guns, carrying out the troop survey, and determining the data to be passed to the guns as fire orders. The battery command post, on the other hand, is responsible for

* Although no medium artillery is organic to the Canadian division, it is normal for a medium regiment from an AGRA (Army Group Royal Artillery) to be allotted to the divisional artillery when committed.—The Editor.

co-ordinating the fire of the battery on all regimental and higher targets and on certain battery targets. For this purpose, it is organized to duplicate the technical work performed by the two troop command posts in order to permit control and provide a final check on all technical work done by the troop command posts. If the proper checks are carried out, each item in the sequence of fire orders is confirmed by independent check at least twice and usually three times. No technical work is performed at the regimental headquarters, but, rather, the fire of the batteries is controlled and co-ordinated through the battery command posts by telephone and radio. In the Canadian battery, the ammunition and POL (petroleum, oil, and lubricants) are carried in battery transport, re-supply being co-ordinated by the regiment, while in the United States battalion there is a service battery provided to perform these duties and others. This is merely a difference in the allocation of transport which has no real effect on the working of the two types of units, as control is centralized in both cases, the United States service battery having the ability to break down into gun battery portions if necessary for independent operations.

The United States battery can be better compared with our troop. It is organized, deployed, and fought as a single unit. Its fire is directly controlled from a battery command post, but the technical work is done by the fire direction center at the battalion headquarters. The battery officers are responsible for deploying the battery, commanding the gun position, and controlling the fire as directed by the battalion fire direction center.

The United States artillery battalion is more rigidly controlled than its counterpart, the Canadian regiment. The fire of all batteries on any type of target is controlled from the battalion fire direction center which does all the technical work for the batteries. All forward observers

address their requests for fire to the fire direction center, which, in turn, allots a battery, or whatever amount of support it feels is required for a mission. The forward observer then passes his fire orders to the fire direction center which converts them into commands and passes them to the battery or batteries concerned. There is no delay in relaying these orders to the guns, the fire direction center performing much the same task as a Canadian battery command post might under certain circumstances. Although the United States teaching requires battery command posts to perform technical work at all times, from what I can learn this is not always done and varies from one unit to another. In any event, this is desirable, but, in most cases, not essential for the functioning of the unit. The main function of the battery command post, once the battery is deployed, is general supervision of the position.

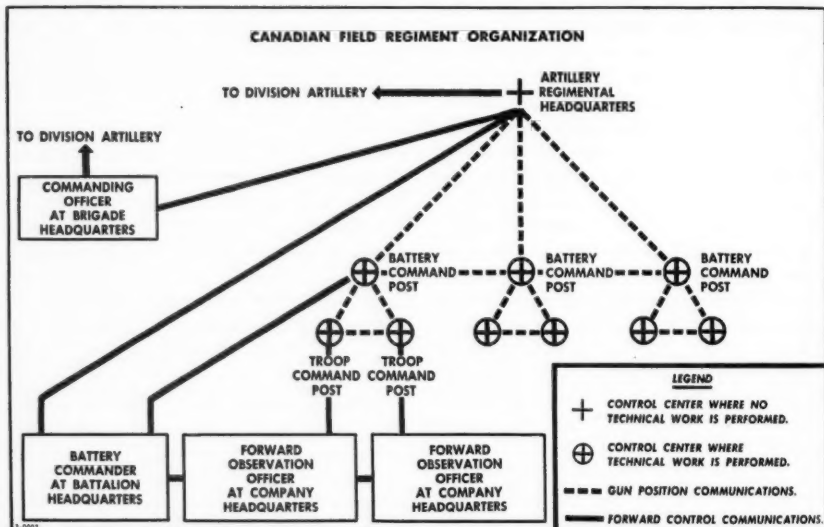
From the foregoing, it would appear that the Canadian battery is more self-contained than its United States counterpart and perhaps can conduct independent operations more readily. This does not mean, however, that it can function more efficiently in this role.

The outstanding difference between the two batteries lies in the location of the command group. The command of the United States battery is found at battalion headquarters and the battery command post, while the command of the Canadian sub-unit is found at the observation post and with the headquarters of the unit being supported. The relative merits of these two systems will be discussed in later paragraphs.

The centralized system of fire control as found in the United States battalion has its advantages and disadvantages. With this system, fewer numbers of specialists are provided for command post and fire direction center work. Surveyors

and other personnel at battalion headquarters are trained in fire direction center duties in order to provide the required relief for the specialists. With this reduction in highly trained specialists comes fewer problems in the initial training of the unit. This is a most important con-

ket," the fire direction center. There is not the degree of flexibility that there is in the other system. Unless the United States battery command post is able to take over and undertake all its own technical work and effect the necessary liaison with the other batteries and the forward



This gives in diagrammatic form the layout of the Canadian field regiment in support of an infantry brigade. For the sake of simplicity, the forward control communications for one battery only is given. The basic communications are such as shown in the diagram. The complete system is much more complex, employing radio and telephone.

sideration, especially during the early stages of mobilization when training time is so vital, school resources are greatly overtaxed, and units must be trained quickly.

Under the United States system, a small number of trained specialists can carry on for a limited period until the full complement is brought up to a satisfactory standard by on-the-job training. This also is true of the Canadian unit, except that a few more specialists will be required initially. As I see it, one of the principal disadvantages of the centralized system is that "most of the eggs are in one bas-

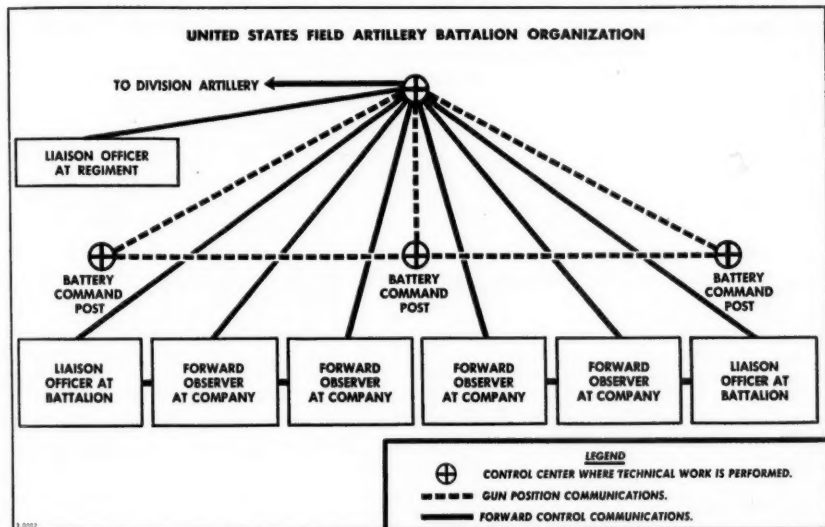
observers, it is completely dependent upon the battalion fire direction center for the firing of the guns and the co-ordination of the battalion's fire. Under the Canadian system of control, the neutralization of any one of the control agencies would have no effect upon the fire of any of the guns for even a very short period, because all levels of control are duplicated. Under the centralized system, according to the teaching, but apparently not always in actual practice, all senior commanders locate themselves at or near the fire direction center. Should this area become neutralized, the action to assume tempo-

rary control of the battalion fire must come from an officer of comparatively junior rank. While this is feasible, it is not the most desirable situation.

Possibilities of the Future

It is readily agreed that past experi-

at the same time, our infantry is heavily attacked, our artillery must, as in the past, play a major role in defeating the attack. By decentralizing our technical work to the batteries, duplicating it at troop level, and performing it right on the gun position, we are minimizing the



This gives in diagrammatic form the layout of the United States field artillery battalion in support of an infantry regiment with two battalions up. More forward observers may be allowed if required. The basic communications are shown in this diagram. Alternate channels, both radio and telephone, are provided and used as the need for them arises.

ence has shown that the neutralization of the fire direction center even for a short period is a very rare occurrence, but with the enemy artillery we are likely to face in future conflict, especially in the early stages when we will probably be on the defensive, such occasions should not be too remote to receive very serious consideration. If the United States evolved a standard drill for firing the battalion without the fire direction center, and all batteries religiously performed their own technical work, this criticism would be nullified. If our gun areas are subjected to sudden and heavy bombardment and,

chance of control being lost. If a troop command post is knocked out, the battery command post takes over as it is equipped to do at all times, and if the guns of a troop are neutralized or knocked out the troop command post is not required, but the rest of the regiment is able to fire as usual. Under our system, in the worst case, at least some of the guns will be able to fire, and under centralized control. From a strictly functional point of view, however, I do not think there can be any argument one way or another as regards the technical efficiency of either system. They both work well, and I do not think

either can claim more speed or accuracy over the other.

Most Controversial Point

We now come to what is without a doubt the most controversial point of difference between the two systems. I think it is the crux of the whole matter, for if we were agreed on this the rest would take care of itself. I refer to the organization for the forward control of the fire of the unit.

In the United States battalion the forward observers are from the junior officer ranks. It is not uncommon for the battalion to use enlisted men as forward observers for short periods until replacement officers become available or until these enlisted men can be commissioned in the field. The artillery battalion commander is represented at the infantry battalion headquarters and the infantry regimental (brigade) headquarters by a liaison officer who is a captain, or possibly a major if the situation warrants it. These are true liaison officers in that they have no command responsibility, but live with the supported unit always, even when out of action. The artillery battalion commander visits regimental headquarters at least daily, and the infantry battalion headquarters frequently. The liaison officers are responsible for acting as artillery advisers to the commanders of the units being supported and as their own commanding officers' representatives with the infantry. They also are responsible for directing the forward observers much as do the Canadian battery commanders.

The final decision as to what artillery support will be provided for the infantry battalion rests with the senior artillery commander concerned, usually represented by the artillery battalion S3 (a major) in the fire direction center. The forward observer may request fire, but not demand it or order it even from his own battery or battalion. The final decision, therefore,

rests with the artillery even up to and including divisional artillery level, after which the division commander must decide. I do not intend to imply that there is lack of harmony between the United States infantry and artillery under this system, which I am sure is not the case, but I merely wish to point out the differences in our thinking on this question.

The Canadian System

In the Canadian regiment, the reverse procedure is followed. The junior officers (lieutenants) are responsible for the gun positions and all survey and technical work. The senior officers live and work with the units being supported. The commanding officer bases himself during action at the headquarters of the brigade he is supporting and visits his unit daily to attend to matters requiring his personal attention; the battery commanders (majors) live and work with the infantry battalion commanders that their respective batteries are supporting; and the troop commanders (captains) are the forward observers for those battalions, being located with the forward rifle company commanders. It is only when the supported battalion or brigade is in reserve or out of action that the senior officers rejoin and live with their respective units and sub-units.

The troop commanders are the forward observation officers and are permitted to call directly upon their own troops for supporting fire. They normally can call for fire from the battery without reference to the battery commander who is at the infantry battalion headquarters, but they will usually have to get his consent to fire the regiment or more artillery. This, of course, varies with the situation, and a policy is laid down at all times by the unit commander defining the amount of artillery a battery commander may use, over and above his own battery, on his own responsibility during the period in question.

When a forward observation officer wishes to fire a battery or larger target, he may do so through his troop, battery, or the regimental command post, whichever he chooses. Other batteries and regiments follow up each ranging correction as it is given out, and by this means all the artillery allotted for the target is ready to fire at the same time as the ranging gun.

The United States Attitude

The United States attitude is that the command organization should remain in the gun area and that all that it is necessary to have forward is the machinery to pass on the requirements to the guns and to advise the infantry on artillery matters. The complete battle situation is known at the artillery battalion headquarters while the forward observer has only local knowledge. For this reason, the United States artillery officer maintains, junior personnel are sufficient for forward observer duties. At the same time, the battalion commander, by at least daily visits to infantry regimental headquarters, effects the necessary liaison with the infantry commander.

The Commonwealth artillery holds that command must be exercised from forward positions with the arms being supported. Our stand is that the man on the spot must be able to turn to his infantry opposite number and state with authority, "I will give you the fire you want," or, "I advise against it for the following reasons . . ." After stating his reasons, the gunner must leave it to the infantryman to decide the question, provided it is possible to supply the fire requested, as the battle at hand is the infantry commander's responsibility and the gunner is there to help and advise him, not to fight his own battle as he sees fit. Because we follow this principle, we provide quite senior officers for the forward command functions (one rank junior to the infantrymen with which they deal) so that their opinions will be treated very seriously by

the infantry commander and their influence will be felt.

Greatest Point of Difference

This is the greatest point of difference in our thinking, and it is most difficult for a gunner to lay aside personal loyalties and look at the problem completely objectively, as each line of reasoning has its own merits. One may perhaps cite a number of cases where United States artillery support has suffered because of differences of opinion between the infantry and artillery which could have been avoided if a more senior artilleryman had been on the spot. On the other hand, the United States artilleryman can produce literally thousands of cases where the relationship was completely harmonious and could not have been improved.

There are other differences between the units of the two services, but these are very minor. We have different communications systems, but we are equally communications-conscious and follow the same principles to provide the maximum flexibility and the minimum chance of breakdown. We both, in our forward control communications, provide our armies with their main channels of battle intelligence. We both almost dogmatically practice the principle of concentration of fire, and we both resist vigorously the tendency of anyone to disperse and dissipate the artillery effort. We have both produced more than our fair share of top commanders and we both have succeeded in convincing our comrades in the other arms of the service that, in paving the way for the successful operations of all phases of war, the importance of artillery to them cannot be overemphasized.

From the foregoing, it would appear that the United States and Commonwealth artillery, although differing somewhat as to the means to be taken to attain the end, operate on the same sound principles and produce an almost identical end item, concentrated fire on the ground where and as it is required.

The Battle Group

Digested by the MILITARY REVIEW from an article by Norman Archer in "The Army Quarterly" (Great Britain) January 1952.

ARMY evolution is notoriously slow. The Maginot Line mentality was unfortunately not confined to the French and the old shibboleth of defense held sway in the various staff creeds until the Germans, previously held as copyists and improvers, swept this away in the Battle of France by introducing mobile warfare.

Turning to the title of this article, we have the mobile "battle group" encountered by the British and the Americans in the close country of Normandy after the successful landings on D-day. The German Seventh Army, faced with an overwhelming gun and air superiority, was at a decided disadvantage, coupled with a lack of mobility as shown by its widespread use of horse-drawn transport. Its role, until the completion of Patton's armored "right hook" and the subsequent retreat to Belgium and Holland, was almost entirely confined to defense; a defense that was tenaciously fought for months. The German High Command was at fault in not reinforcing this army after it became plain that this was the main event. However, in the chaos of battle, it evolved the battle group.

At a strength of one battalion of infantry, supported by a few self-propelled guns and a handful of tanks, these formations would punch a gap in a British division and cause a disruption out of all proportion to its numbers. The forward movement of a corps would grind to a halt until the wedge was eliminated. The soldier in battle will not fight well with a threat to his rear, and with the accent on supply, the modern army soon is rendered ineffective if gasoline or ammunition fails to arrive. Armies have got along for considerable periods with little or no food, and will do so again in future wars, but

guns and armor must have food or the army dies.

Reason for Success

The success of the German battle group lay in the fact that it was self-contained. The infantry was not expected to combat opposing armor, but simply whistled up 88-mm guns or tanks in their own group and stubbornly held vital positions for days. If they had been adequately supported from the air, they might have gone far in blunting the allied attack and driving it back to the hard-won beaches. It cannot be stressed too much that the almost complete elimination of the German Air Force was the paramount factor in the defeat of the Seventh Army in Normandy.

We now know from interviews with German commanders that their lack of air support was crippling. Phrases like "We lost contact with X division on our left"; "No orders came through for 3 days"; "We had to fall back as each position was outflanked"; and "Reserves and supplies failed to arrive" give some idea of the bewilderment in the enemy camp. It says much for the discipline of the German system that they were able to put up such a stout opposition when one considers the personnel of their units composed as they were of a good proportion of Russian, Slovak, and other eastern and European types. This mixture of foreign elements in armies is no new thing. Napoleon drafted nationals from nearly every country in Europe to fill the gaps in the *Grande Armée*.

Composition of a Battle Group

However, let us return to the question of the battle group. Depending on the situation, the formation could be anything

from battalion to brigade strength with the infantry weapons integrated fully with armor, artillery, and service units. Where possible, a flight or squadron of aircraft would train with the ground force. Co-operation between the air and the ground has not always been too happy. One remembers occasions in Normandy, Italy, and Tunis where a deplorable lack of liaison, ground recognition, or faulty briefing led to severe losses with consequent bad feeling between the services.

Co-operation Difficulties

Co-operation between the infantry and armor has presented many difficulties. The footslogger has come to regard tanks as something to be called up every time the going gets tough. The experienced tank man knows from bitter experience the limitations of his weapon, and, with the improved antitank weapons now coming forward, combined with the ever present mine field, these costly and vulnerable vehicles are in a transitory state. Maybe in time they will join the battleship in the discard unless some form of mobile mine-sweeper or destroyer is evolved to sally out in front of an armored attack.

Again, the actual contact between the infantry and the fast-moving tank has shown the need for drastic revision of communications. Nearly every battalion history of the last war has some pungent criticism of "combined" actions that failed to do just that.

Analyzing the British Division

If we take the British division of three brigades with ancillary signals, artillery, supply, and others, we come up against a rigid division of the functions of the separate arms. In World War I, the infantry's task was comparatively simple from a technical angle. Somewhere at the rear of each battalion in the line was the field and heavy artillery. The Royal Engineers, Royal Army Medical Corps, and

"specialists" were attached, sometimes permanently, but often being withdrawn to other formations as replacements just as they were settling in and working harmoniously with the division or brigade. The artillery observation officer lived in or about the front line and responded to any request for support from the infantry, and reported targets back to his batteries, but he nevertheless remained a comparative stranger to the infantry, was removed by wounds, death, or recall, and a new man was laboriously inducted. The batteries often pulled out, leaving their guns in the pits to be taken over by a new battery unacquainted with the terrain and problems of the sector. Meantime, the infantry sweated grimly on in the deadly routine of that war: a week at a time in the line, support and reserve, while the daily attrition whittled down their numbers.

A Need for Improvisation

This rigidity of the British Army in World War I was noted by the Germans, and one of their commanders has stated that all British attacks, with the exception of one or two like Cambrai, followed a fixed pattern, with no improvisation to meet previous lessons, and the Germans made their defensive plans accordingly. It has often been said by various military writers that the Germans were no better, that once their plans became unstuck they folded up. However, at least they had learned something by 1918, and their infiltration tactics nearly won the war.

The reader might be pardoned if he thought by this time that this article is a eulogy of German military genius. The writer is fully aware of their points and drawbacks from military angles. It is well never to despise an opponent, but rather to learn both from his successes and failures, so that he may be the more readily beaten.

The battle group then will become a reality. The size of a group will be con-

ditioned by circumstances of attack or defense, but will probably not exceed a brigade in strength, and will more probably be limited to the numbers of a battalion. Commando and airborne operations bear some resemblance, but these are necessarily specialist formations, limited by their very nature to lightly armed troops whose success and often final existence depend on completely integrated forces of all arms following up.

The future battle group, whatever its size, can remain a component of its immediate brigade, division, or corps. In action, it will be entirely on its own, in effect an army within an army. One recalls the heroic Free French at Bir

Hacheim where, completely dug in with all-round defense, they withstood the assaults of Rommel's armor and dive bombers until the end. Such actions will swing the verdict in future battles. The reduction of such formations is a costly and time-wasting operation for any attacking commander, but their employment as a regular feature of modern armies is yet to come.

The military mind from experience is slow to change. It is only in the crucible of war that new ideas, born of desperate situations, are given a trial, often reluctantly. The rapid invention of new weapons must inevitably cause a revision of tactics, if not of strategy, which remains a fairly constant factor.

New Threat—Soviet Navy

Digested by the MILITARY REVIEW from an article in
"U. S. News & World Report" (United States) 11 April 1952. *

THE Soviet Navy is no longer a joking matter. Almost unnoticed, the Soviet Union has developed a strange, yet formidable, fighting fleet. It has more active ships than the United States, is overtaking our lead in heavy combat ships, and has the world's largest submarine fleet.

Soviet sea power, once ignored, is giving serious concern to Western defense planners—and that power is still growing. Western officials are just now beginning to show serious concern over the fast-growing Soviet Navy, as reliable facts and figures come to light to show what is happening. What the reports show is this:

The Soviet Union seems to be building a new type of fleet. Its basic weapons are guided missiles and torpedoes, not

large naval guns. The emphasis is on new types of submarines, but surface fleets as well are being built up. Large battleships and cruisers of a wholly new type, designed primarily to use missiles (guided and free rocket), are the backbone of the Soviet Navy now under construction. There seems to be no interest in aircraft carriers, but great interest in fast interceptor vessels. Altogether, the Soviet Union's naval tonnage has risen, within the last 10 years, from seventh to third place among the navies of the world, and it may go to second place when the current building program is completed. Then, only the United States Navy will be larger—and only in tonnage, not in the number of combat ships.

Compared with the United States Navy, it is a strange sort of fleet. It has virtually no defensive strength. It cannot escort convoys or expect to defeat other navies at sea. However, at the present

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time, it probably is unsurpassed in ability to intercept an enemy's vital life lines overseas, to attack an enemy's coastal cities, or to break up a large amphibious landing operation with missile attacks.

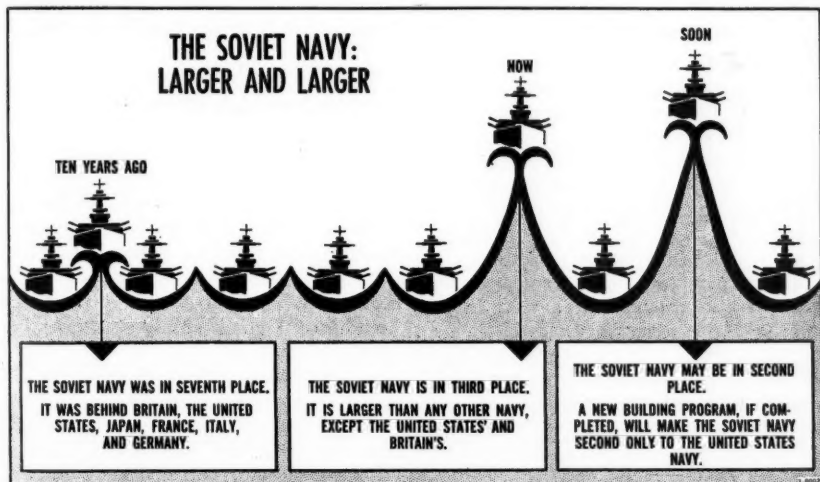
Aircraft Carriers

In aircraft carriers, which form the backbone of the United States fleet, the new Soviet Navy has no real strength. It is reported to have only one carrier,

present Soviet battleships are said to be equipped with one or two catapult towers for firing radio-controlled aerial torpedoes, and also rocket-firing apparatus and radio-controlled guns. Moreover, those under construction also will carry two batteries of guided missiles in addition to the torpedo and rocket-firing armament.

Cruisers

In cruisers, too, the Soviet Union soon



the captured German *Graf Zeppelin*, now being used as an experimental ship for guided missiles. The United States has the world's largest carrier fleet, with a total of 27 ships. Carriers are handy for defending convoys and naval task forces, but they do not fit into the Soviet formula for an interceptor fleet.

Battleships

In battleships, however, the Soviet Navy is strong, and growing stronger. Where the United States has four conventional large battleships, the Soviet Union has three modified dreadnoughts and three more under construction. According to the authoritative *Jane's Fighting Ships*,

will far outnumber the United States, at the present rate of construction. The Soviets now have from 15 to 20 cruisers, all new or remodeled since World War II, and they plan to add 20 more, including 4 "super-cruisers." The United States has 15 heavy and 3 light cruisers on hand, with none under construction. The Soviet Union's large fleet of cruisers appears to be designed for the fast interception of enemy convoys and missile bombardment of enemy coastal areas.

Destroyers

In destroyers, Soviet strength is well behind that of the United States, but it is increasing fast. Where this country has

244 destroyers, the Soviet Union has 70 regular destroyers plus 33 small, high-speed destroyers, and she plans to build 120 additional ships of both types. Their missions, however, differ greatly. United States destroyers are primarily for anti-submarine duty and convoy protection. Soviet types are believed to be largely for patrol duty—to locate enemy convoys and task forces, to be worked over by Soviet submarines, and to patrol Soviet coastal areas.

Torpedo Boats

The Soviet Union is well ahead in torpedo boats, which can be useful for protecting inland seas and intercepting an enemy fleet in areas such as the Baltic or the Mediterranean. She has several hundred of these specialized craft, and has hundreds more under construction.

Submarines

In submarines, however, the new Soviet fleet has its greatest strength. *Jane's Fighting Ships* lists 375 or more for the Soviets, and adds that they plan to build 1,000 more. This compares with a German strength of only 67 submarines at the start of World War II, and with an average German strength of 132 during wartime, when submarines nearly cut the United States-to-Europe life lines.

Not all of these Soviet submarines are large, long-range models. Many are old, and not equipped with the snorkel breathing device which enables newer types to stay underwater indefinitely. Probably a third of these craft are very small "Malutka" models, suitable only for interception jobs near harbors, in inland seas, or just off a coastal area. Others are sea-going submarines of 500 to 800 tons, usable in the Baltic, Black, and Arctic Seas, the Sea of Japan, and, to a lesser degree, in parts of the Pacific and Atlantic Oceans. The largest Soviet submarines are the fleet type of 1,000 tons and up, which can go anywhere and can operate for pro-

longed periods. That is the line-up of the present submarine fleet as reported by the well-informed quarterly review, *Foreign Affairs*. New construction is expected to be largely of the latest long-range type.

What concerns Western defense officials most about the Soviet submarine fleet, however, is not so much its size as its quality. Submarines of World War II types can be combated, but three new developments in postwar submarines, if perfected by the Soviets, can make underwater craft very difficult to find and destroy. These are:

1. The snorkel device.
2. The closed-cycle submarine engine, which the Germans developed toward the end of the war to provide the engine with its own oxygen, by using hydrogen peroxide, thus making it unnecessary for the submarine to come to the surface periodically for air, or even to expose its snorkel.
3. The atomic-powered engine, which could give submarines unlimited range, high speed, and the ability to stay underwater indefinitely.

Naval Planes

In naval planes, finally, the new Soviet fleet has no carrier based types, but it is strong on coastal patrol models. In fact, near Soviet coasts, naval torpedo bombers could be as much of a threat as the Soviet submarine and surface fleets. More than 2,000 combat aircraft are known to be under Soviet Navy command, and nearly all of these guard Soviet or satellite coastal areas. New types of jet-powered, long-range naval patrol planes are reported, as are hundreds of land-based dive bombers.

Totaling the Score

That is how the new Soviet Navy appears to stack up at this time. It means that the Soviets now have the world's largest undersea fleet, a formidable naval air fleet, and a surface fleet that is surpassed in size only by the United States

and British surface fleets. Altogether, the Soviets are known to have at least 536 combat ships, compared with 473 larger combat ships in the United States fleet. In addition, the Soviet Union is reported to have more motor torpedo boats, submarine chasers, inshore patrol craft, and other small coastal vessels in active use than the United States and British Navies combined. Many vessels of all types are captured models, or are old, poorly equipped, and obsolete by United States standards, but a modernization program is bringing even these types into usable shape.

The expansion of the Soviet fleet, moreover, will greatly increase the strength of underwater and fast surface interceptor types. According to *Jane's Fighting Ships*, Soviet plans call for at least 1,143 more ships. That would bring the size of the Soviet Navy up to 1,707 combat ships, plus small craft, as compared with the presently planned expansion of the United States Navy to about 1,200 combat ships. In the process, the Soviet Navy would pass the British Navy in size and approach the tonnage of the American fleet.

What Are its Capabilities?

What the Soviet Union's Navy can do,

of course, is more important than the number of ships in her fleet. If war between the United States and the Soviet Union should occur, in the opinion of responsible naval officers:

The greatest danger will be from Soviet submarines cutting American supply lines to Europe and from sources of raw material elsewhere.

The danger to United States cities on or near either coast is less publicized, but it is just as real, especially with the new Soviet fleet concentrating on missile weapons.

The danger to the United States fleet is less evident, but it also must be considered because of the new weapons and the growing size of the Soviet Union's surface fleet, and the possible effectiveness of her new-model submarines. Long-range missiles with atomic warheads, for example, could conceivably wreck a United States task force before Soviet ships were even sighted.

All told, the long-ignored Soviet Navy now appears to be moving into the big time, becoming a serious menace to defense plans of the West—and the outlook is for the Soviet threat to increase greatly in the next few years.

A perusal of available military and civilian publications, during the past 3 months, indicates that material from the MILITARY REVIEW was reprinted in the following countries:

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Australia	El Salvador	Mexico	Spain
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Canada	India	Peru	United States
Chile	Ireland		

The Editor

Carrier Development

Digested by the MILITARY REVIEW from an article by
Rear Admiral G. P. Thomson in "The Navy" (Great Britain) December 1951.

THE conversion of two United States cruisers for guided missile firing may well indicate an early change in the main armament of large ships. Aircraft, however, still provide the effective striking power of the present-day fleet, a striking power vastly increased by the atom bomb which can be delivered by carrier-borne aircraft. Therefore, the developments which are now taking place in carriers are of considerable interest.

Two Types of Carriers Required

The Soviet Union's geographical situation and the numbers and types of her warships emphasize the lesson of the last war that we must have two types of carriers—one for antisubmarine warfare and the other for attacks on land and sea surface targets during offensive operations. In World War II when we found the U-boats operating in the mid-Atlantic, we obtained some 45 escort carriers from the United States. These vessels, which were constructed on merchant ship hulls, accompanied the convoys throughout the voyage and did splendid work in keeping U-boats submerged and preventing them from shadowing convoys on the surface and attacking in packs at night.

Changes in Antisubmarine Weapons

However, concurrent with the increase of the submarine's offensive power because of the snorkel and her increased submerged speed, aids to aircraft in antisubmarine warfare also have made rapid strides. The weight and size of both detecting devices and antisubmarine weapons now being installed in aircraft have increased to such an extent since the war that modern antisubmarine aircraft will be incapable of operating from ships with the small dimensions and limited speed

of the escort carrier used during the war. The escort carrier of the future will require a vessel to be of approximately the size, speed, and performance of the Glory class.

The six Glory-class carriers—and the three similar vessels whose construction has been suspended—can no longer be regarded as having any real value for fleet work, for operating in enemy waters against land based aircraft. Laid down in 1942-43, at a time when the urgent need for both repair and new construction of merchant ships imposed rigid economy in naval building, they were regarded as makeshift carriers, and intended to meet immediate fleet requirements in the Pacific theater.

The *Triumph*, *Theseus*, *Glory*, and the Royal Australian Navy's *Sydney* have since done splendid service in Korean waters, but they are already stretched to the limit in being called upon to operate aircraft of a weight half as heavy again as those of 6 years ago, and with take-off and landing speeds some 30 knots in excess of their predecessors. Moreover, apart from the small number of aircraft carried—about 40—their maximum speed of 23 knots is insufficient to operate jet and other modern aircraft.

Modernization Required

The greatly increased size, weight, and speed of modern aircraft already have necessitated the modernization of our six existing fleet carriers (the *Victorious* is now in hand), and also a delay in the completion of the *Ark Royal*—sister ship of the *Eagle* and started only 6 months later—to enable still more modern equipment to be installed in her. Before the last war, the aircraft of both belligerents

were restricted by the same conditions in having to operate from a carrier. It was a comparatively simple problem for our naval constructors and engineers to design vessels which, in performance and other operational requirements, were at least as good as, if not superior to, the carriers of a potential enemy. Under modern conditions, however, the offensive function of the carrier has largely changed.

Operational Tasks

In the absence of potential enemy battle fleets, British fleet carriers in the future are likely to be required for general reconnaissance duties and for task force operations in enemy waters, including also the provision of air cover for expeditionary forces on passage and during the landing until air bases can be established ashore for land based aircraft. Moreover, whether or not naval aircraft are to assist the Royal Air Force in strategic bombing, there will be many opportunities for medium-range bombing from carriers operating off an enemy's coasts. All these duties entail opposition from enemy shore based fighters, and it is thus essential that our fleet carriers should be able to operate fighters of the latest type, which it is possible to operate from carriers, in addition to the most powerful bombers, offensively and defensively. Hence, the need for major alterations, involving an increase in the strength of the flight deck and the installation of higher performance arrester gear and catapults, and other important modifications, both to existing carriers and those now under construction.

In view of the demands for shipping in time of war, it will not be easy to find merchant ships suitable for conversion to escort carriers of the type which is now recognized as a light fleet carrier. Fortunately, the prospect of being able to fit carriers with a flexible rubber flight deck should improve matters considerably, since landing on a rubber deck eliminates the need for the undercarriage which requires a percentage of the total weight of an aircraft out of all proportion to its value. If the project proves successful, it will greatly increase the effectiveness of the naval air arm, both by reducing the performance requirements of escort carriers and enabling fleet carriers to operate aircraft of increased range, armament, and performance.

Greater Tactical Freedom

Undercarriageless aircraft will, of course, have to be catapulted to become airborne, but this has little disadvantage since catapulting is now becoming the standard method of launching all of our latest aircraft. Catapulting, if it increases slightly the launching interval, gives a carrier the immense asset of greater tactical freedom, because she no longer has to alter course into the wind prior to flying off. Steaming into the wind for landing will still be necessary, but there is normally sufficient notice of this for the necessary action to be taken to adjust the position of the carrier. Indeed, this tactical freedom given by the use of the catapult may be regarded as an effective answer to those who argue that the large fleet carrier is far too vulnerable for operations in enemy waters.

BOOKS OF INTEREST TO THE MILITARY READER

THE RISE OF TOTALITARIAN DEMOCRACY. By J. L. Talmon. 366 Pages. The Beacon Press, Boston. \$4.00.

By LT COL IRVING HEYMONT, *Inf*

In this book, the first of a series of three, Professor Talmon examines the roots of totalitarian democracy in the French Revolution. The following two books will trace further developments up to the present day.

According to the author, both liberal and totalitarian democracy agree on the value of liberty. While the liberal form believes in development by trial and error, the totalitarian form assumes an exclusive truth in politics. The totalitarian democracy is Messianic in nature in that it further assumes a preordained perfect scheme of things which will inevitably be reached. Force, it preaches, may be required to hasten its progress.

Modern totalitarian democracy is a dictatorship resting on popular enthusiasm. This dictatorship of the Left has as its starting point man, his reason, and salvation. As a result, it tends to assume the character of a universal creed. Because the application of force by the dictatorships of the Left is theoretically to hasten the progress of man's salvation, Professor Talmon believes it is legitimate to refer to it as democratic totalitarianism.

The dictatorships of the Right have as their starting points the state, nation, or race. They assume men to be inherently weak and corrupt. Force is used to maintain order and to train man to act in a manner alien to his mediocre nature.

The detailed study of the views of Babeuf and his plot is a well-rounded picture of the thoughts of one of the principal precursors of Marx and of the mechanics of a revolutionary effort. Professor Talmon makes clear the debt owed by Marx and the Bolsheviks of 1917 to the lessons of the French Revolution and its subsequent upheavals.

While the book is thoroughly documented, nothing distracts from smooth reading. The serious student of history and social ideas is indebted to Professor Talmon for this lucid coverage of a complex subject.

LINCOLN AND HIS GENERALS. By T. Harry Williams. 363 Pages. Alfred A. Knopf, Inc., New York. \$4.00.

By CAPT JAMES S. EDGAR, *MPC*

This is a fascinating story of Lincoln and his many trials in directing the Civil War. It is not a military history but an exciting, dramatic human story of the part played by the Commander in Chief. It contains many previously unpublished sketches of this great man and of those he placed in command—McClellan, Pope, Buell, and Hooker—and many others ending with the appearance of Grant, the one trusted and confided in above all the others.

The author has accomplished an interesting and valuable account of the events of this time. Military personnel will find this book of great value in their studies of the Civil War from a political and military standpoint.

THE COMING DEFEAT OF COMMUNISM. By James Burnham. 278 Pages. The John Day Company, New York. \$3.50.

By COL GEORGE C. REINHARDT, *CE*

The coming defeat of communism is "inevitable" says Burnham, in the sense that a brave captain assures his troops that victory is inevitable, expressing "resolution not to yield, to fight to the end." So too the defeat of communism depends upon the "number of determined men who so resolve."

Thus is expressed the same note of conservative optimism sounded by Vannevar Bush in *Modern Arms and Free Men*. It is encouraging to note two important thinkers, as distinct in their views as Burnham and Dr. Bush, who dare lighten the prevailing gloom of the Western world's forebodings of the struggle between communism and freedom.

In all respects but his conclusion, however, Burnham differs radically from Bush. Both emphasize the value of freedom, the necessity of determined defense to preserve it. But Burnham depends little upon science and "normal" governmental procedures, placing his reliance upon the mental, even the psychological, aspects of the conflict which, he rightly insists, is currently a fact, not a future possibility.

This book will shock diplomats with its insistence that "traditional diplomacy" is dead and useless in the crisis; disturb the military mind with its emphasis upon resistance (subversive) warfare; and irritate industrialists with its attack upon their ideas that business "deals" are possible with communism (Burnham terms that concept the "suicidal mania of American business"). Only for labor, American anti-Communist labor, has he a good word initially, praising the Reuthers, Dubinsky's, and Lundbergs for their relatively successful onslaught against Communist influence within labor ranks. He deplores this country's failure to assist materially

the anti-Communist labor organizations of France, Germany, and Italy.

Yet having outraged, to varying degrees, so many influential groups, Burnham goes on to somewhat smooth ruffled feathers, to offer elements of hope, however unpalatable the medicine he prescribes for each.

He concludes, rightly enough, if one accepts his premise, that communism is actually on the defensive and ripe for attack by new, nontraditional methods of diplomacy, by treating with people instead of with governments and government officials.

In conclusion, Burnham claims that his recent "20,000-mile slow trip through the United States" convinces him that this country "in Mackinder's meaning is a going concern" not a "mature economy" ready to quit, cynical and indifferent to patriotism.

Our Nation's uneasiness, which we all feel and see too widely expressed in pessimistic forecasts, official emphasis upon "preserving the peace" to an extent that falsely imputes pacifism; these manifestations, concludes Burnham, are not indications of "awareness of death," but the "tormenting pause before the leap into maturity."

SOVIET LEGAL PHILOSOPHY. By 10 Russian Writers. Translated by Hugh W. Babb. 465 Pages. Harvard University Press, Cambridge, Mass. \$7.50.

By CAPT JOHN A. NOBLE, *JAGC*

This book consists of 12 articles, written by 10 Russian writers, concerning the position of the law in the Soviet state, covering the period 1919 to 1945. The book is designed to show the initial Soviet philosophy of law and the subsequent changes in this philosophy as the state matured.

The articles are difficult to read as the writers are attempting to justify what appears to be an untenable position. The 20-page introduction by John N. Hazard makes excellent reading.

STALIN'S SLAVE CAMPS (An Indictment of Modern Slavery). By Charles Orr. 104 Pages. The Beacon Press, Boston. Cloth, \$1.75. Paper, \$.75.

By MAJ ROGER E. LAWLESS, *SigC*

In "an appeal to the conscience of the entire world," the author, who is Research Officer in the Economic and Social Department of the International Confederation of Free Trade Unions, traces the long campaign by the unions to establish a tribunal where free labor can submit charges and evidence of forced labor. This end was achieved in March 1951 when the United Nations set up a Commission on the Investigation of Forced Labor.

Stalin's Slave Camps is thus an indictment presented to the UN and the world and aimed at "the elimination of brutal enslavement of man by man, a barbarous practice which thrives today in the Stalinist Empire on a scale rarely known in history." Actual slaves are reported as 15 million people, or 1 in 10. Every source is exploited, whole populations uprooted, to provide the mass labor needed for state projects. The "slave laws" of the satellite nations are presented in excerpts and naturally parallel those of the USSR itself.

Happily, the author has something constructive to offer. He states the program of free labor will stop the further spread of enforced labor. The program is based on an assumption that men with something really worth defending will not allow themselves to be enslaved. Hence, free labor must publicize the barbaric terror of Stalin's slavery, strive to raise the economic standards of peoples exposed to advancing communism, and reaffirm and enforce the basic human and political rights of those peoples.

To the trained lawyer, it is always morbidly interesting to note the pathetic attempts of Soviet Russia and her satellites to place their tyrannical practices on a "legal" basis. The author points out that the Communists regard their oppressive

regulations as "laws" and "encoded justice" simply because they have gone to the trouble to set them down in writing; as if to say, what more does the worker need or expect?

Stalin's Slave Camps adds to the formidable array of similar recent books which seek to dissect the Communist mind. Mr. Orr's trepanning on slavery is expertly handled. The book is a text on the subject of man's inhumanity to man among the 400 millions in the "worker's paradise" and beyond.

HISTORY OF MARINE CORPS AVIATION IN WORLD WAR II. By Robert Sherrod. 496 Pages. Combat Forces Press, Washington, D. C. \$6.50.

By LT COL WILLIAM H. SOUDER, JR., *USMC*

Published on the 40th anniversary of its founding, this history of Marine Corps aviation is truly an excellent portrayal of the part played by that service during World War II.

Written primarily for the 1 percent of our armed forces that served in Marine aviation units during World War II, the history sketches the Corps' growth in the field of aviation from its woobly beginning on 22 May 1912, through World War I, and the "banana" wars of the twenties, to 7 December 1941. Thereafter, Mr. Sherrod relates in detail the exploits of the men and squadrons that fought back against Japan from Wake Island to Tokyo.

Accurately documented and illustrated, this book not only relates the experiences of a daring group of pilots and their untiring ground crews, but also covers the development of the type of close air support that has made Marine aviation famous.

A team of qualified Marine Corps historians collected material for this book over a period of 4 years. Mr. Sherrod then transformed their efforts into an action-packed, fast-moving narrative which is a "must" for all interested in military history.